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IN THE

Supreme Court of the United States

OCTOBER TERM 1975

No. 75-415

PORTLAND CEMENT ASSOCIATION
An Illinois Not-For-Profit Corporation
Petitioner

v.

ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY
Respondent

MEDUSA CORPORATION
NORTHWESTERN STATES PORTLAND CEMENT CO.
Intervenors

PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

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Petitioner, Portland Cement Association, prays that a Writ of Certiorari issue to review the decision and order of the United States Court of Appeals for the District of Columbia Circuit in this case.

Opinion Below

The opinion of the Court of Appeals for the District of Columbia Circuit, reported at 513 F.2d 506, appears in the

Appendix. (A-1) The petition below was filed, as provided in the statute, with the Court of Appeals. Thus, there was no trial court action or decision. The petition was originally heard in 1973 and the court remanded the record to the agency with instructions. 486 F.2d, 375, *cert. denied,* 417 U.S. 921. (A-7) Following remand, the case was reargued. The court's subsequent opinion is the subject of this Petition.

Jurisdiction

The decision and order of the court below was entered on May 22, 1975. A timely petition for rehearing was denied on June 19, 1975 (A-6) and this petition for certiorari was filed within 90 days of that date. The Court's jurisdiction is invoked under 28 U.S.C. § 1254(1).

Questions Presented

1. Must the cost of pollutant control be related to expected environmental benefit and public welfare need in the promulgation of stationary source standards under § 111 of the Clean Air Act, or may the EPA Administrator impose the most stringent standard "technologically achievable" regardless of economic cost or demonstrated need to protect public health and welfare?

2. Must a clear air standard reliably indicate a degree of pollution and be capable of reasonably accurate measurement, or—

(a) Is a mass standard to measure *total* pollution valid if it can be violated by a *momentary* excessive emission?

(b) Is a plume opacity standard valid when equal amounts of pollution can produce plumes of varying

opacity and subjective measurement of the degree of opacity is highly inaccurate?

3. Do constitutional guarantees against discrimination apply to environmental regulations to prevent different standards for sources whose emissions of the same pollutant can be controlled to the same extent?

Statutes and Regulations

The statutes and federal regulations involved in this case are:

Administrative Procedure Act, 5 U.S.C. § 553, 706.

Clear Air Act, 42 U.S.C. § 1857

Standards of Performance for New Stationary Sources, 40 C.F.R. 60.42, 60.52, 60.62, 60.92

The pertinent parts of these statutes and regulations are set forth in the Appendix.

Statement of the Case

The Clean Air Act provides for ambient (ground level) standards specifying air quality necessary to protect public health and welfare. To achieve this degree of air quality, the states are directed to issue and enforce implementation plans, which are subject to EPA approval.[1] This is an ongoing program.[2]

Supplementing this pattern of regulation, the Act provides for federal standards to limit the emission of pollutants from newly constructed or modified stationary

[1] 42 U.S.C. § 1857 c-4, 5

[2] *See Train* v. *Natural Resources Def. Council,* _____ U.S. _____, 43 L.Ed.2d 731 (1975)

sources.[3] The EPA administrator is directed to promulgate such standards—

> which reflect[s] the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction) the Administrator determines has been adequately demonstrated. 42 U.S.C. § 1857 c-6 (a)(1), (A-109)

Characteristically, the Administrator has issued two types of standard for particulate[4] emissions from new stationary sources: a mass standard which can be expressed as the weight of the particulate contained in a unit of exhaust gas; and an opacity standard stated as the relative density of the plume from a stack emitting the gas.

The Administrator intends each of these standards to perform a distinct function in his regulatory scheme. The more reliable mass standard (tested by collecting and weighing particles in the exhaust gas) is applied to newly constructed facilities when they become operational to demonstrate that the installation *can* meet the standard.[5] The plume opacity standard is directed toward subsequent enforcement, i.e., to measure whether the facility is continuing to comply with the regulation.[6] This functional distinction is not prescribed by the statute, which provides that exceeding any standard at any time is unlawful.[7]

---

[3] 42 U.S.C. § 1857 c-6 (A-109)

[4] The particulates with which this case is concerned are small particles of ash or dust suspended in industrial exhaust gasses. There is no indication that their chemical or physical characteristics make them *inherently* harmful to health or property. Only their presence in excessive volume is undesirable.

[5] 40 C.F.R. § 60.8 (A-104)

[6] 486 F.2d at 400 (A-56, 64)

[7] 42 U.S.C. § 1857 c-6(e) (A-111)

In response to his statutory directive, the Administrator promulgated the following standards for particulate emissions from cement, asphalt concrete and fossil-fuel burning power plants and municipal incinerators:[8]

	grains per dry standard cubic foot	plume opacity
Cement plants	.03*	10%
Asphalt concrete plants	.04	20%**
Power plants	.06*	20%
Municipal incinerators	.08*	None

* Max. 2 hr. avg.

** 40% opacity 2 min./hr. allowed

When the cement standards were promulgated in 1971 Petitioner sought to have them set aside because:

> Achievability had not been adequately demonstrated—the two tests on which the mass standard was based had not been conducted in accordance with EPA's own test procedures for measuring compliance;
>
> Cost had not properly been taken into account—great cost to remove a small volume of pollutants would be required at the level of control prescribed by the standard and public health and welfare need had not been shown;
>
> Plume opacity is not a constitutionally valid standard under an anti-pollution statute because opacity is not a reliable indicator of pollutant volume and observers' ratings of plume opacity are highly inaccurate; and
>
> The mass standard is discriminatory—it requires cement plants to exert a higher degree of control at greater incremental cost to produce cleaner emissions than sources emitting a greater volume of the same type of pollutants whose emissions can be controlled to the same degree by the same type of equipment.

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[8] 36 Fed. Reg. 24876 (12-16-71); 37 Fed. Reg. 5767 (3-21-72); 39 Fed. Reg. 9309 (3-8-74) (A-104 et seq.)

Upon first hearing, the reviewing court found the administrative record inadequate but did not set the standards aside. It remanded the record to the Agency, principally for further explanation concerning the validity of the tests on which the standards were based.[9] The opinion suggested that the Administrator should consider cost studies submitted to him;[10] explain the propriety of basing a 2 hour average standard on a 30 minute test;[11] support the plume opacity standard as being "consistent with the statute" and demonstrate that opacity measurements can be made with reasonable accuracy.[12] The Court stated that the *statute* does not require the Administrator to justify standard differences between industries but did not mention or discuss constitutional guarantees against discrimination.[13]

During the course of remand—

(1) Petitioner submitted an analysis showing that 20% of the total cost of control of a cement plant using a precipitator[14] would be required to remove the last 1/10 of 1% of particulate required to meet the standard —a cost-benefit ratio of more than 100 to 1; and pointed out that nothing in the record indicated the removal of this last 1/10 of 1% is needed to protect public health or welfare. Petitioner also identified gross errors and omissions in two cosmetic economic studies which the agency had prepared in connection with the promulgation process.[15]

[9] *Portland Cement Ass'n* v. *Ruckelshaus*, 158 U.S. App. D.C. 308, 486 F.2d 375 (1973); *cert. denied*, 417 U.S. 921 (1974) (A-7)

[10] *Id.* at 320 (A-29)

[11] *Id.* at 330 (A-48)

[12] *Id.* at 334 (A-56, 58)

[13] *Id.* at 322 (A-32)

[14] This device is necessary in some plants and its use was contemplated in the standard-setting process. 37 Fed. Reg. 5767 (3-21-72) (A-106)

[15] Assumed model plant size, interest rates and fuel costs were grossly under-estimated and no consideration was given to ability to raise necessary capital in the face of predicted shortages of capital funds.

(2) The Administrator, responding to the court's comment that he should explain how 30 minute sampling episodes could demonstrate compliance with a 2 hour average performance, simply removed the averaging period from the mass standard.[16] This was done without advance notice to permit public comment.[17]

(3) The Agency conducted further plume opacity testing and relaxed the opacity standard from 10% to 20%.[18]

During remand the Administrator submitted to Petitioner a draft of his proposed response, Petitioner commented, and the Administrator supplemented his response and returned the record to the Court. In his response,[19] the Administrator:

(1) Did not attempt to explain the errors in his economic studies and stated that he believes the strictest achievable standards should be set (regardless of cost), that cost-benefit analysis cannot be applied to stationary source standards, that the agency does not relate to cost of control to the amount of pollutant collected, and that the effect of the standards cannot be related to the ambient air standards which identify levels required to protect public health and welfare.[20]

(2) Conceded that different particle sizes, stack diameters and weather conditions will produce different opacities in plumes containing the same pollutant volume, and that a substantial number of qualified observers would rate a complying 20% plume to be in violation, some of them rating it to be as much as 38% more opaque than it really is. He stated that a source

[16] 39 Fed. Reg. 20791 (6-14-74)

[17] This violated express provisions of the Administrative Procedure and Clean Air Acts. 42 U.S.C. § 1857 c-6(b)(1)(B) (A-111); 5 U.S.C. § 553(c), § 706 (A-107, 108)

[18] 39 Fed. Reg. 39874 (11-12-74); 40 C.F.R. § 60.62 (A-105)

[19] EPA Response, etc., EPA—450/2-74-023 (Nov., 1974), (hereinafter "Response") (A-60 et seq.)

[20] Response, 65 (A-60-63)

complying with the mass standard could be expected to violate the opacity standard on occasion and that he would not enforce the 20% standard unless the observer rated the plume to be more opaque than 27.5%.[21]

(3) Conceded that power, cement and asphalt concrete plants all can control particulate emissions to the same degree, but furnished no rational explanation for the differences in the standards for those sources.[22]

On the basis of the supplemented administrative record the Court issued its *per curiam* decision holding the cement standards to be valid.[23] In its decision the court:

(1) Held that the Administrator need not apply cost-benefit analysis to stationary source standard-setting and opined that a technologically achievable standard need not be relaxed unless an industry can prove effectively that it cannot bear the costs of meeting the standard and survive;

(2) Validated a mass standard to control total pollution which can be violated by a momentary increased emission, the standard having been amended by a procedure which violated two statutes;

(3) Upheld the plume opacity standard, commenting that future learning might support the value of plume opacity in pollution control; and

(4) Stated it could find no basis to invalidate the cement standard as discriminatory and added that "accumulating experience" might present a basis for narrowing the differences between the cement and other standards. Constitutional guarantees against discrimination were not mentioned.

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[21] *Id* at 109 et seq. (A-91, 94, 73, 90, 78, 88)

[22] *Id* at 67, 68 (A- 62, 63)

[23] *Portland Cement Ass'n.* v. *Train*, 513 F.2d 506 (U.S. App. D.C. 1975) (A-1) Judge Leventhal who wrote the remand decision and heard oral argument after remand did not participate in the decision.

Reasons for Granting the Writ

In stark relief this case presents three distinctly defined issues of critical current national importance:

(1) Must the cost of pollution control be balanced against environmental benefit and public health and welfare need;

(2) Can clean air standards be valid if they fail to reliably measure pollutant volume with reasonable accuracy; and

(3) May sources which can be controlled to the same degree be subjected to different levels of control.

Resolution of these issues will establish basic legal parameters for all environmental regulation by specifying the principles essential to valid regulation; the requisite characteristics of a valid standard; and the extent to which the Constitution applies in allocating, between sources, the responsibility to clean the environment.

These important issues of federal law have not been settled. They have been the source of extensive confusion and contention in the federal administrative process and in state processes which have followed federal leadership. This confusion and a massive volume of litigation at all levels impedes the sound progress of environmental improvement. These impediments should be removed by an authoritative decision of this Court in this case which, because it does not concern an immediate loss of employment or exposure of a community to a potential health hazard, is not a "hard case" likely to make "bad law." Without such a decision, however, substantial losses of national productivity and employment opportunity are inevitable.

Unless the Writ issues, the decision below will be cited to support contentions that the cost of environmental control is irrelevant, that unreliable standards which cannot be measured with reasonable accuracy are valid, and that constitutional guarantees do not apply to environmental

regulations. Such contentions will spawn and feed proliferating litigation.

1. Relating Cost, Environmental Benefit And Public Welfare Need In Stationary Source Standard-Setting Concerns A Vital Question Of Federal Law Which Should Be Settled By This Court.

Virtually every informed, concerned and responsible source throughout government, industry and academia urges that cost-benefit analysis be applied to environmental regulation. The Administrator, however, denies the obligation to apply such analysis to a major part of the federal clean air program—the setting of stationary source standards.[24] The Administrator's position has been upheld by the court below. This result is contrary to the will of Congress as expressed in the Clean Air Act. Since the court below has exclusive jurisdiction over direct review of clean air standards,[25] only this Court can correct that interpretation and restore the will of Congress.

The Clean Air Act states promotion of public health and welfare *and national productivity* as principal purposes.[26] This declaration expresses the intent of Congress that the Act be "both an *economic* measure and an air pollution measure".[27] Accordingly, § 111 directs that standards be set

[24] He also resists responsibility to apply economic consideration in his review of state implementation plans. See: *St. Joe Minerals* v. *EPA*, 508 F.2d 743 (3d Cir. 1975) pet. for cert. pending; *Union Elect. Co.* v. *EPA*, 515 F.2d 206 (8th Cir. 1975); *Ind. & Mich. Elect. Co.* v. *EPA*, 509 F.2d 839 (7th Cir. 1975); *Buckeye Power Co.* v. *EPA*, 481 F.2d 206 (6th Cir. 1973). In the case at bar EPA's duty to consider cost is *even greater* than in its review of implementation plans. The stationary source standards are *federal* standards and if EPA does not consider their economic impact no one will.

[25] 42 U.S.C. § 1857 h-5(b)(1) (A-112)

[26] 42 U.S.C. § 1857(b) (A-109)

[27] In the debates on the final passage of the Act, the following colloquy occurred:

> "MR. RANDOLPH. I know at times on the subcommittee and on the committee we have talked about the economics of this legislation as well as to health standards of the legislation, and I know that the Senator from Maine has been one of those who have recognized that this legislation is *both an economic measure* and an air pollution measure. I believe that this is correct; may I inquire whether the Senator shares that view? MR. MUSKIE. The Senator is correct." 116 Cong. Rec. 43293, (12-18-70) emphasis supplied.

"taking into account the cost of achieving" them.[28]

This unmistakable legislative directive has been rejected by the Administrator. He stated to the court below:

> We believe that Congress intended § 111 to be used to establish emission limitations which are the lowest that can be achieved by that industry. Where the cost of meeting such standards would be so great that the industry could not bear the costs and survive, such standards could not be implemented by the industry regardless of technological feasibility.[29]

He does not accept the possibility that the standard would be relaxed to permit the industry to survive. His position is now established federal law by virtue of the decision below.

The economic cost of pollution control is a major matter of vital national concern. Vast expenditures will be required to achieve federal standards.[30] Critical limitations on the availability of capital funds to finance these costs are predicted by responsible sources.[31] Obviously, the diversion of limited capital from productive to pollution control facilities

[28] 42 U.S.C. § 1857 c-6(a)(1) (A-24, 109)

[29] Response, p. 66 (A-61)

[30] The Council on Environmental Quality estimates the economic abatement costs required by current federal environmental legislation to be 195 billion dollars through 1982. *The Economic Impact of Environmental Programs,* (CEQ, 1974).

[31] *The Capital Needs and Savings Potential of the U.S. Economy* (N.Y. Stock Exchange, Sept., 1974); *Capital Needs in The Seventies* (Brooking Inst., 1975); Conf. Bd. Inc. Study, B.N.A. Envir. Rptr., p. 366 (6-20-75)

will depress national productive capacity and employment opportunity and place upward pressure on prices. Nevertheless, these adverse effects must be undertaken to a major extent in order to clean the environment. But Congress did not intend our limited financial resources to be wasted by expenditures which secure only minimal environmental benefits.

In order to assure that the maximum *benefit* is attained at minimum *cost,* these two factors must be quantified and balanced. All responsible, concerned sources (except EPA and the court below) require or urge that such balancing be applied to environmental regulations. These sources include the National Environmental Policy Act,[32] the Clean Air Act (as interpreted in the Appeals Court's remand decision[33]), Congressional committees,[34] knowledgeable professionals,[35] the Council on Environmental Quality,[36] and the President of the United States.[37]

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[32] This Act requires an impact statement which explains "the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity." 42 U.S.C. § 4332 (A-113)

[33] ". . . section 111 of the Clean Air Act, properly construed, requires the functional equivalent of a NEPA impact statement." 486 F.2d at 384 (A-22)

[34] "By setting standards that are perhaps too high, we have forced massive expenditures that may result in only modest improvements. . . ." H.R. Rpt. No. 93-275 at 53

[35] "What is spent for pollution control must meet a cost-benefit analysis to show that the money is spent better here than elsewhere." Conf. Bd. Rpt., BNA Envir. Rptr., p. 366, 6-20-75

[36] "Decisions on attaining different levels of environmental quality need to take into account the benefits to be attained and the costs to be incurred. When the expected gains are large relative to the costs, it is clearly in our interest to move forward in cleaning up the environment." (*Environmental Quality,* 1971 at 118)

[37] "All too often the Federal Government promulgates new rules and regulations which raise costs . . . to achieve small or limited social benefits. In these cases, we must either revise proposed rules and regulations to lower costs or we must not adopt them." BNA OSHA Rptr. p. 1554 (5-1-75)

Those statutes and commentators have recognized the widely applicable principle that costs of control increase exponentially as benefit levels rise—to the point where massive cost is required to achieve a minimal improvements in the benefit level.[38] This principle is more fully articulated in a report to the Michigan Public Service Commission which states as follows:

> The costs of pollution control vary exponentially with the degree of pollution abatement. It is generally not expensive to exercise substantial pollution control (i.e., 75-90 percent). However, it is extremely expensive to control pollution the last little bit (e.g., from 90 percent to 95 percent, or 95 percent to 99 percent, or 99.0 percent to 99.5 percent). This means that a stringent set of regulations is extremely expensive. On the other hand, this also means that a great deal of money can sometimes be saved by relaxing stringent regulations slightly, without corresponding adverse environmental effects. *Environmental Protection Study,* p. 3 (ICF, Inc. Wash. D.C., 1975)

Despite this groundswell of informed opinion and the obvious national interest need, cost-benefit analysis was not applied in setting the cement standards. The Administrator states:

> EPA does not believe that cost-benefit analysis can be established for standards under § 111 nor does it believe that Congress intended that standards be established or justified on the basis of such an analysis.[39]

The court below effectively affirmed this Agency contention.

The Administrator is wrong. Cost-benefit analysis can and is being applied to environmental regulations by qualified professionals.[40] EPA's annual reports to Congress

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[38] "Costs of curbing the amount of discharged wastes vary at different levels of abatement. Usually the higher the proportion of waste discharge that is curtailed, the greater the cost of abatement per unit withheld." *Environmental Quality* 1971 at 118 (CEQ 1971)

[39] Response, p. 66 (A-61)

[40] E.g., *Environmental Protection Study, supra.*

entitled "The Cost of Clean Air" state the cost necessary to achieve its standards. These are cost-benefit analyses.

Two cost-benefit approaches are possible. Cost can be related to the improvement in ambient air quality or to the volume of pollutants removed from source emissions. The Administrator rejects both approaches.[41]

He states that the cost of meeting stationary source standards cannot be related to the effect on ambient air levels.[41] *He speaks with forked tongue.*[42] To the public he pledges that in proposing standards he will "delineate" environmental effects and discuss "economic factors".[43] He does not explain his rejection of a published EPA staff report concluding that economic cost and environmental benefits *can* be balanced.[44] And in a May 25, 1975 letter to Senator Muskie he identified over 5,000 sources in 8 major categories (which do not include cement plants) whose limited control capabilities will prevent ambient standards

[41] If the Administrator really cannot relate his standards to ambient air quality he may well be exceeding his power under the Constitution and the Clean Air Act, the stated purpose of which is "to promote the public health and welfare." 42 U.S.C. § 1857 (b)(1) (A-109)

[42] The current EPA Administrator was the CEQ chairman when it reported that environmental decisions should balance costs against benefits. (Note 36 *supra*)

[43] 38 Fed. Reg. 15653 (6-14-73)

[44] *Application of NEPA to EPA's Environmental Regulatory Activities*, (EPA, Feb., 1973). That report states: "1. Substantive Effects: Full compliance with NEPA will result in better documentation of the secondary impact of the standards and of the criteria for selection of the source categories to be regulated. The alternatives explored, both in regard to standards and technology, would be disclosed to the public. Any adverse effects would be made public with the rationale for the standard set and the balances of benefit versus adverse effects. Currently the development of new source performance standards takes into account the cost of control and the economic impact of the standard. If compliance with NEPA requires a balancing of cost and environmental effects or benefits, significant changes in the standards might occur so that best control technology might not be prescribed. The performance standards, therefore, may not meet the criteria of the Act".

from being achieved by mid-1975.[45] This conclusion could not have been reached without relating stationary source emissions to ambient air quality.

Comparing cost to the amount of pollution abated is also rejected by the Administrator. This is the approach referred to by the Council on Environmental Quality.[46] Utilizing this approach Petitioner presented a cost-benefit analysis constructed from data published by the Council and EPA itself. The Administrator brushed this aside without explanation. He said:

> This type of cost effectiveness analysis was neither the basis for setting the Portland cement standard nor any other new source performance standard.[47]

"This type of cost effectiveness analysis" is precisely what the statute requires when it directs the Administrator to take into account the cost of achieving a "degree of emission limitation." 40 U.S.C. § 1857 c-6(a)(1), (A-109) As stated in the remand opinion section 111 "requires the Administrator to 'take into account the cost of achieving such reduction'." (A-24)

In short the Administrator will not give meaningful consideration to cost in his stationary source standard setting and he has been upheld by the *only* court authorized to review his action. In the national interest this Court cannot permit that result to stand. As stated by a congressional committee:

> The potential impact on the economic and social well-being of this nation of actions by [EPA] is so great that it is absolutely essential that the Agency be required to consider the impact of [its] actions. H.R. Rpt. No. 93-275 at 54 (1973)

[45] BNA Envr. Rptr. p. 474 (7-17-75)

[46] *Supra*, note 43

[47] Response, p. 67 (A-62)

2. The Validation Of The Cement Standards Conflicts Directly With This Court's "Conclusive Presumption" Decisions And Should Be Reversed.

The cement standards create a conclusive presumption that a source which exceeds the standard violates the statute. Under these circumstances, the regulation must have a "rational relationship to the statutory purpose"[48] and must be "necessarily or universally true in fact."[49] This principle is established by several decisions of this Court. *Bell* v. *Burson*,[50] *Stanley* v. *Illinois*,[51] *Vlandis* v. *Kline*, *U.S.D.A.* v. *Murry* and *Cleveland Bd. of Ed.* v. *LaFluer*,[52] see also *The Irrebuttable Presumption Doctrine in the Supreme Court*, 87 Harv. L. Rev. 1534 (1974); *The Conclusive Presumption Doctrine*, 72 Mich. L. Rev. 800 (1974).

The statutory purpose is to curb pollution. Thus the standard must "necessarily" and "universally" indicate the maximum volume of pollution which the statute permits.

Momentary emissions do not "necessarily or universally" indicate total pollutant volume. The defect of a momentary emission standard can be understood by applying simple common sense, i.e., a source emitting pollution at a steady rate of 1 lb./hr. would comply with a 2 lb./hr. standard. But a source operating at ½ lb. rate for 59 minutes and polluting far less than the other source would exceed the standard and violate the law if, for one minute, it emitted at a rate greater than 2 lb./hr. This phenomenon is recognized by the OSHA standards and the EPA ambient air standards which prescribe reasonable time periods to compute average concentrations.[53] Apparently recognizing the

[48] *U.S.D.A.* v. *Murry*, 413 U.S. 508 (1973)
[49] *Vlandis* v. *Kline*, 412 U.S. 441 (1973)
[50] 402 U.S. 535 (1971)
[51] 405 U.S. 645 (1972)
[52] 414 U.S. 632 (1974)
[53] 29 C.F.R. § 1910; 42 C.F.R. Part 410

propriety of such standards, EPA initially prescribed a 2 hour averaging period for particulate emissions.[54] Only after the court suggested the Agency should explain how a 30 minute test could prove 2 hour performance, did the Agency remove the averaging feature.[55]

Plume opacity also *cannot* be a valid standard. The opacity of a plume does not "necessarily or universally" indicate the amount of pollution it contains. EPA's response[56] frankly stated that the same amount of pollution can produce different plume opacities depending on the size and shape of the particles, the diameter of the stack and the weather conditions, and conceded that emissions which comply with the more accurate mass standard can, at the same time, produce a plume which violates the opacity standard.[57] Recognizing this possibility the U.S. Department of Commerce has protested the use of plume opacity as a standard.[58]

Additionally, visual evaluation of plume opacity is inaccurate.[59] The Administrator concedes that, on occasion, even under controlled conditions, nearly one-third of a group of qualified observers may rate a 20% plume as much as 27.5% opaque—an error of 38%.[60] This inaccuracy is highlighted by the standards themselves where a 20% level is applied equally to cement plant plumes and to other plumes which are permitted to contain more than *twice* the

[54] 36 Fed. Reg. 24876 et seq. (12-16-71)
[55] See pp. 6, 7 *supra*
[56] No non-judicial expertise is necessary to adjudicate this matter. The reviewing court need only read what the Agency says.
[57] Response, p. 111 et seq. (A-91, 94, 90)
[58] 38 Fed. Reg. 34766 (10-21-74)
[59] For a complete discussion of this subject see *Visual Plume Readings—Too Crude for Clean Air Laws*, VII *Natural Res. Lwyr.* 457 (1974)
[60] Response, p. 108, 109 (A-78, 88)

volume of pollutants.[61] This inaccuracy has been confirmed by the American Society for Testing and Materials which, after careful study, concluded that plume readings are not precise enough to provide good emission control or reliable enforcement.[62]

The Administrator's position on this subject is repugnant to law and reason. Governmental regulations must be sufficiently definite to identify the conduct which is prohibited. *Baggett* v. *Bullitt*, 377 U.S. 360 (1963); *Champlin Refining Co.* v. *Corp. Comm'n*, 286 U.S. 210 (1932); *Connally* v. *General Const. Co.*, 269 U.S. 385 (1926). Permitting a plant to be shut down and employees to lose work and income on the basis of the inaccurate subjective judgment of a smoke inspector is a violation of due process rights. This is not cured by the Administrator's unsecured representation that the 20% standard will not be enforced unless the observer reports opacity exceeding 27.5%.[63] If a regulation is too indefinite to be enforced it is too indefinite to be enacted.

The opinion below is equally incredible when it refers to "non-judicial expertise." No such expertise is needed to *read* EPA's comment that a source can, on occasion, exceed the opacity standard even though the volume of pollutants emitted is not excessive. Since this should invalidate the standard under the "conclusive presumption" doctrine, the court below had to reject that doctrine in order to say it is "not warranted" to set the opacity standard aside. And the court's suggestion that future learning might support the

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[61] p. 5, *supra*

[62] *Interlaboratory Cooperative Study of the Determination of the Relative Density of Black Smoke*, ASTM Pub. DS 55-S10 (1974)

[63] This is comparable to a promise that a motorist would not be prosecuted for violating a 55 m.p.h. limit unless he is clocked at more than 75 m.p.h.—nevertheless, some drivers would be prosecuted even though they were travelling at less than 55 m.p.h.

use of plume opacity ignores the clear fact that the more EPA tests this measure of pollution the more unreliable and inaccurate it is proved to be.

Plume opacity standards are no longer necessary for enforcement. New and modified stationary sources must be subjected to an initial performance test.[64] Thereafter, compliance can be assured by a simple inspection of the control equipment (similar to the usual boiler or elevator inspection) much more accurately than by plume evaluation. EPA affirms this, stating that compliance can be assured by enforcement of its prescribed operating and maintenance procedures *even if* plume opacity does not exceed the standard.[65]

Plume opacity regulations have been the source of prolific litigation over the years.[66] Now, more stringent regulations bearing stiffer penalties are being enforced more strictly producing an increasing volume of litigation. The constitutionality of plume opacity standards has been and is being contested in several cases and the issue has previously been presented to this Court.[67]

Probably every stationary source in the U.S. is subject to a federal, state and/or local plume opacity regulation. EPA's studies have revealed fatal defects in these regulations. This Court should resolve the validity of these regulations in this case and eliminate this source of non-productive, increasing litigation.

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[64] 40 C.F.R. § 60.8 (A-104)

[65] 40 C.F.R. 60.11(d) (A-66); 39 Fed. Reg. 9309 (3-8-74)

[66] See 78 A.L.R. 2d 1328

[67] *Air Poll Bd.* v. *Western Alfalfa Corp.*, 416 U.S. 861 (1974) (decided on other grounds)

3. The Professed Inability Of The Court Below To Discern Obvious Discrimnation Departs So Far From The Accepted Course Of Judicial Proceedings That This Court's Power Of Supervision Is Required.

The constitutional violation created by different standards for sources subject to the same degree of control was presented to the court below in four briefs and two oral arguments. The Administrator gave *no* rational explanation for the differences in treatment despite the fact that cement plants are required to exert a much higher degree of control to emit much cleaner air than sources of greater volumes of the same pollutant.[68] The Department of Justice presented *no* legal justification for this action, arguing (after remand) only that it was "the law of the case". The two decisions of the court below *fail even to mention* the Constitution.

The applicable principle of constitutional law is unmistakable. Culminating a long line of uniform opinions, this Court most recently said:

> A statutory classification . . . is consistent with the Equal Protection Clause of the Fourteenth Amendment if it is 'rationally based and free from invidious discrimination'. *Dandridge* v. *Williams,* 397 U.S. 471, 487. While the present case, involving as it does a federal statute, does not directly implicate the Fourteenth Amendment's Equal Protection Clause, a classification that meets the test articulated in *Dandridge* is perforce consistent with the due process requirement of the Fifth Amendment. *Richardson* v. *Belcher,* 404 U.S. 788 (1971).

This principle should prevent EPA from discriminating between sources in distributing the burden of controlling emissions to achieve ambient standard levels. Instead, the Agency contends it may impose standards on an arbitrary

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[68] In a letter from the Administrator to Senator Muskie dated 5/12/75, eight categories of polluting sources expected to violate state implementation plan limits past mid-1975 were identified. Cement plants were not included.

ad hoc basis without reference to the amount of pollution the respective source categories produce.[69] This treatment would not be discrimination *if* there were a rational explanation for the difference in the standards. No such explanation has been supplied.

The stated inability of the court below to discern discrimination could set constitutional law back more than 80 years. In 1892 the Supreme Court of Minnesota, considering a smoke ordinance, said:

> No arbitrary distinction between different kinds or classes of business can be sustained, the conditions otherwise being similar. The statute is leveled against the nuisance occasioned by dense smoke, and it can make no practical difference in what business the owners or occupants of the buildings in which such smoke is produced are engaged. . . . *State* v. *Sheriff of Ramsey County,* 43 Minn. 236, 51 N.W. 112 (1892).

The court below has stated that discrimination should not be permitted in administrative regulations. *Greater Boston Television Corp.* v. *F.C.C.,* 444 F.2d 841, 851 (D.C. Cir. 1970). Apparently its inability to identify discrimination is limited to environmental regulations. Unless the decision below is reversed, the principle stated over the entrance to this Court's home should be amended to read:

EQUAL JUSTICE UNDER LAW

but

NOT UNDER ENVIRONMENTAL REGULATIONS

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[69] In its remand response, the Agency stated: "We believe that Congress intended § 111 to be used to establish emission limitations which are the lowest which can be achieved *by that industry.*" (A-61) (emphasis supplied) Paradoxically, EPA's implementation plan regulations and those of 32 states require *identical* control levels for cement and asphalt concrete plants—but EPA's new source standards provide different levels of control. (APTD-1334, Table III (EPA, 1972), BNA Envir. Rep., St. Air Laws, p. 301 *et. seq.*)

Conclusion

The Writ must issue in this case so that standard-setting bodies will give meaningful consideration to cost and public health and welfare need, promulgate standards which reliably measure pollution, and distribute the burden of achieving clean air fairly and without discrimination between source categories. Any further delay in enforcing the will of Congress and applying established principles of constitutional and administrative law to environmental regulations will impede the achievement of clean air goals.

Respectfully submitted:

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PORTLAND CEMENT ASSOCIATION
v.
ADMINISTRATOR, ENVIRONMENTAL
PROTECTION AGENCY

APPENDIX
to
PETITION FOR A WRIT OF CERTIORARI

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UNITED STATES COURT OF APPEALS

FOR THE DISTRICT OF COLUMBIA CIRCUIT

PORTLAND CEMENT ASSOCIATION, an Illinois not-for-profit Corporation, Petitioner,

v.

Russell E. TRAIN, Administrator, Environmental Protection Agency, Respondent,

Medusa Portland Cement Company and Northwestern States Portland Cement Company, Intervenors.

No. 72-1073.

United States Court of Appeals, District of Columbia Circuit.

Argued April 1, 1975.

Decided May 22, 1975.

Association of cement manufacturers brought suit seeking review of the promulgation by the Administrator of the Environmental Protection Agency, under the Clean Air Act, of stationary source emission standards for new or modified portland cement plants. Subsequent to a remand for reconsideration and clarification of certain matters, 158 U.S.App.D.C. 308, 486 F.2d 375, the Court of Appeals held that (1) no reasonable basis existed for invalidating as discriminatory the achievable emission standards promulgated, (2) the portland cement industry failed to show inability to adjust itself in a healthy economic fashion to the ends sought by the Clean Air Act as represented by the standards, (3) plume opacity was not too unreliable to be used either as a measure of pollution or as an aid in controlling emissions, and (4) the standards prescribed were valid.

Affirmed.

Leventhal, Circuit Judge, did not participate.

1. Health and Environment ⇐28

No reasonable basis existed for invalidating as discriminatory the achievable emission standards promulgated for portland cement plants by the Administrator of the Environmental Protection Agency pursuant to the Clean Air Act. Clean Air Act Amendments of 1970, § 111, 42 U.S.C.A. § 1857c-6.

2. Health and Environment ⇐28

Administrator of the Environmental Protection Agency must take into account the cost of achieving the emis-

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sion reduction he prescribes. Clean Air Act Amendments of 1970, § 111, 42 U.S. C.A. § 1857c–6.

3. Health and Environment ⇐28

Portland cement industry failed to show inability to adjust itself in a healthy economic fashion to the end sought by the Clean Air Act as represented by emission standards prescribed by the Administrator of the Environmental Protection Agency. Clean Air Act Amendments of 1970, § 111, 42 U.S. C.A. § 1857c–6.

4. Health and Environment ⇐28

Plume opacity was not too unreliable to be used by the Administrator of the Environmental Protection Agency, in respect to the promulgation of stationary source standards, as a measure of pollution or as an aid in controlling emissions by portland cement plants. Clean Air Act Amendments of 1970, § 111, 42 U.S. C.A. § 1857c–6.

5. Health and Environment ⇐28

Administrator of the Environmental Protection Agency, in promulgating stationary source emission standards for portland cement plants, satisfactorily considered cement manufacturers' suggested alternative of dispersing pollutants into the air rather than into water. Clean Air Act Amendments of 1970, § 111, 42 U.S.C.A. § 1857c–6.

6. Health and Environment ⇐28

Administrator of the Environmental Protection Agency, in respect to the promulgation of stationary source emission standards for portland cement plants, adequately responded to the Court of Appeals' remand mandate to identify the bases for standards. Clean Air Act Amendments of 1970, § 111, 42 U.S.C.A. § 1857c–6.

7. Health and Environment ⇐28

Stationary source emission standards promulgated by the Administrator of the Environmental Protection Agency under the Clean Air Act for new or modified portland cement plants were valid. Clean Air Act Amendments of 1970, § 111, 42 U.S.C.A. § 1857c–6.

On Hearing Subsequent to Remand Proceedings Before the Environmental Protection Agency.

Robert E. Haythorne, Chicago, Ill., with whom Edward W. Warren, Scranton, Pa., was on the brief, for petitioner.

William L. Want, Atty., Dept. of Justice, with whom Wallace H. Johnson, Asst. Atty. Gen., Edmund B. Clark and Martin Green, Attys., Dept. of Justice, were on the brief, for respondent.

Before FAHY, Senior Circuit Judge, and LEVENTHAL * and ROBB, Circuit Judges.

PER CURIAM:

The court remanded to the Administrator of the Environmental Protection Agency, respondent, the case then before us involving the validity of the stationary source standards [1] he had promulgated [2] under section 111 of the Clean Air Act [3] for new or modified portland cement plants. Portland Cement Association v. Ruckelshaus, 158 U.S.App.D.C. 308, 486 F.2d 375 (1973), cert. denied, 417 U.S. 921, 94 S.Ct. 2628, 41 L.Ed.2d 226 (1974). Some of the matters the court then reviewed on the petition of the Portland Cement Association we concluded required further consideration and clarification, hence the remand. These matters have now been reconsidered and clarified in the Administrator's Response to the Remand Order, formulated after his draft of such Response had been the subject of comments by the Association and others. The Association has again petitioned this court, to decide whether the Administrator has complied with the remand order and whether the standards should be affirmed or set aside.

At argument petitioner's counsel relied upon a formulation of positions which he handed to the court and which reads as follows:

1. Do established constitutional guarantees against statutory discrimination apply to environmental regulations?
2. If so, may the victim of a discriminatory regulation have it set aside through direct judicial review?
3. Under what, if any, circumstances could economic considerations produce a standard lower than the highest technologically achievable?
4. How does a standard prohibiting *momentary* excessive emissions conform to a statute whose purpose is curbing the total volume of pollution?
5. How can plume opacity be [a] valid standard when pollution and plume opacity can not be reliably correlated and evaluations of the same plume by several qualified observers will vary substantially?

The issues raised in these questions are more limited than those presented by petitioner in its brief. Therefore, although the questions will form the frame of reference for this opinion, other issues will be touched upon as well.

Questions 1 and 2 are directed to petitioner's contention that the emission standard for cement plants is more stringent than those for incinerators and coal-fired power plants, and, also, for plants of the competing asphalt industry, as to which, however, no question had been raised at the agency level.

[1] Petitioner's contention is weakened by its admission, made in its comments on the Administrator's draft response to the remand, that the standard for the portland cement industry is achievable by that industry. Moreover, our remanding opinion indicated our disagreement with petitioner on the subject of different emission standards for different industries. See, 486 F.2d at 389. Amplifying upon what we there said, we find no reasonable basis for invalidating as discriminatory the achievable emission standard for cement plants. Proof of unreasonableness in the diversity of the standards referred to is lacking. No doubt the Administrator will be influenced by accumulating experience should it give rise to reasons for modification of the range now existing between the prescribed standards.

[2, 3] Petitioner's question No. 3 is very generally phrased. Neither the terms of our remand nor the proceedings now before us require an answer by the court. We note, however, that of course section 111 of the Act requires the Administrator to take into account the cost of achieving the emission reduction he prescribes. In our remanding opinion we did not require respondent to prepare a quantified cost-benefit analysis, showing the benefit to ambient air conditions as measured against the cost of the pollu-

* Circuit Judge Leventhal did not participate in this decision.

1. These standards prescribed a maximum emission limit of .03 gr/scf for particulates (cement dust) from newly-constructed or modified cement plants and a limit of 10% for the opacity of plumes from the stacks of such plants.

2. 40 C.F.R. § 60.62 (December 16, 1971).

3. 42 U.S.C. § 1857c–6.

tion control devices. We stated, however, that such studies as might be adduced in comments should be considered and that the Administrator should also consider contentions and presentations that the adopted standard unduly precludes the supply of cement, including whether it is unduly preclusive as to certain qualities, areas, or low-cost supplies. Though the Administrator found that "relating the cost of control to the benefits of the control at least at this time is a practical impossibility," he went on to state that where the costs of meeting standards would be greater than the industry could bear and survive, such standards could not be implemented by the industry regardless of technological feasibility, and, moreover, that a gross disproportion between achievable reduction in emission and cost of the control technique would not be required. Here too we find no reason to disagree with the Administrator's disposition of this aspect of the remand. The industry has not shown inability to adjust itself in a healthy economic fashion to the end sought by the Act as represented by the standards prescribed.[4]

Question No. 4 was not at issue on the remand and we accordingly do not feel called upon to deal with it.[5]

[4] As to question No. 5, we have considered the detailed analysis by the Administrator of numerous factors involved in the use of plume opacity to determine whether or not a portland cement plant achieves a prescribed standard of pollution control. We are not warranted on the basis of his analysis to find that plume opacity is too unreliable to be used either as a measure of pollution or as an aid in controlling emissions.

The Administrator, using trained plume observers, has enlarged upon the tests previously utilized, in the effort to reach a reasonably accurate standard of measurement of opacity. He sets forth in detail the results which led to his 10% standard "as the standard which may not be exceeded by new kilns at Portland cement plants," with a relaxation, however, now permitted, to 20% opacity "to accomodate certain extreme circumstances." His conclusions in resolving the opacity problem and the achievability of the prescribed opacity standard are well reasoned. The court finds no sound basis for rejecting them, remembering the tempered review we exercise in these matters of non-judicial expertise, and remembering too that in this, as in a somewhat related area which recently confronted the Supreme Court under the Clean Air Act, the courts cannot and do not "attempt to foresee, at this stage in the administration of the statute, all of the questions, say nothing of the answers, that may arise"—in that case over the allocation of a limited number of available variances under section 110(a)(3) of the Act[6]—in this case over the learning with respect to the value of plume opacity in measuring and controlling pollution.

[5] We turn to another matter. In our remand decision we held that respondent was not required to file an impact

4. The Administrator in his Response to the Remand Order has fully considered and rationally rejected the cost-benefit analysis which was submitted by petitioner.

5. We add that the record before us affords no basis for holding that controlling momentary excessive emissions does not aid in curbing total pollution.

6. Train, Administrator v. Natural Resources Defense Council Inc, — U.S. —, — n.28, 95 S.Ct. 1470, 43 L.Ed. 2d — (1975).

statement pursuant to the National Environmental Policy Act,[7] but should set out "significant adverse environmental consequences" of its standards as a "functional equivalent" of an impact statement. We note now a contention raised by petitioner in this regard, namely, that water pollution will be aggravated as a result of the larger piles of kiln dust caused by the tight emission controls. We have no factual basis, however, for disagreeing with the position of the Administrator that petitioner's contention that the dispersal of the pollutants into the air would better serve the environment. The Administrator satisfactorily responds to this suggested alternative as follows, insofar as the record before us affords a basis for decision:

> . . . the total amount of particulates disposed of will be less if collected by emission control devices than if vented uncontrolled into the atmosphere.
>
> To the extent there is a problem, it is the judgment of the Administrator that the problem of water run off from collected piles of particulate matter is less than the problem of uncontrolled releases of particulate matter into the atmosphere.

[6] Finally, we note the Administrator's response to the court's direction that the bases for the emission standard should be further identified. At the time of our remand tests on only two cement plants had been conducted. Since then the Administrator has tested five more plants. Although petitioner had an opportunity to comment on the results of only two of these, all seven tests have shown that the emission standard is achievable. The Administrator has in this as in other respects adequately responded to our remand.

[7] The consequence is that we hold the standards prescribed to be valid. The action of the Administrator in promulgating them is, accordingly,

Affirmed.

7. 42 U.S.C. §§ 4321–4335.

United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 72-1073 **September Term, 1974**

Portland Cement Association, an
Illinois Not-For-Profit Corporation,
Petitioner

v.

Russell E. Train, Administrator,
Environmental Protection Agency,
Respondent

Medusa Portland Cement Co.
Northwestern States Portland Cement Co.
Intervenors

United States Court of Appeals
for the District of Columbia Circuit
FILED JUN 2 6 1973
HUGH E. KLINE
CLERK

Before: Fahy, Senior Circuit Judge; Leventhal and Robb, Circuit Judges.

ORDER

On consideration of petitioner's petition for rehearing,

it is

ORDERED by the Court that petitioner's aforesaid petition is denied.

Per Curiam

For the Court:

Hugh E. Kline
HUGH E. KLINE
Clerk

Circuit Judge Leventhal did not participate in the foregoing order.

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United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 72-1073

PORTLAND CEMENT ASSOCIATION, AN ILLINOIS NOT-FOR-PROFIT CORPORATION, PETITIONER

v.

WILLIAM D. RUCKELSHAUS, ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY, RESPONDENT

MEDUSA PORTLAND CEMENT CO.

NORTHWESTERN STATES PORTLAND CEMENT CO., INTERVENORS

Petition for Review of an Order of the Administrator, Environmental Protection Agency

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Decided June 29, 1973

Robert E. Haythorne, with whom *Perry S. Patterson* was on the brief for petitioner.

James R. Walpole, Attorney, Department of Justice with whom *Kent Frizzell,* Assistant Attorney General, *Edmund B. Clark* and *Martin Green,* Attorneys, Department of Jus-

tice, were on the brief, for respondent. *Raymond N. Zagone,* Attorney, Department of Justice also entered an appearance for respondent.

Robert H. Shepard was on the brief for intervenor, Northwestern States Portland Cement Company.

William H. Wallace was on the brief for intervenor, Medusa Corporation.

Turner T. Smith, Jr., filed a brief on behalf of Long Island Lighting Company and National Asphalt Pavement Association, as *amici curiae* urging reversal.

Perry S. Patterson entered an appearance for intervenors.

Before FAHY, *Senior Circuit Judge,* LEVENTHAL and ROBB, *Circuit Judges.*

Opinion for the Court filed by *Circuit Judge* LEVENTHAL.

LEVENTHAL, *Circuit Judge*: Portland Cement Association seeks review[1] of the action of the Administrator of the Environmental Protection Agency (EPA) in promulgating stationary source standards for new or modified portland cement plants, pursuant to the provisions of Section 111 of the Clean Air Act.[2] Medusa Corporation and Northwestern States Portland Cement Company were granted leave to intervene by this court and they together with petitioner, will be referred to as the cement manufacturers. Long Island Lighting Company has filed a brief as an Amicus Curiae.

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[1] Section 307(b)(1) of the Clean Air Act, 42 U.S.C. § 1857h-5(b)(1), requires that a petition for review of the action of the Administrator in setting standards of performance under section 111 of the Act "be filed only in the United States Court of Appeals for the District of Columbia."

[2] 42 U.S.C. § 1857c-6.

I. STATEMENT OF THE CASE

Section 111 of the Clean Air Act directs the Administrator to promulgate "standards of performance" governing emissions of air pollutants by new stationary sources constructed or modified after the effective date of pertinent regulations.[3] The focus of dispute in this case concerns EPA compliance with the statutory language of Section 111(a) which defines "standard of performance" as follows:[4]

> (1) The term "standard of performance" means a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction) the Administrator determines has been adequately demonstrated.

After designating portland cement plants as a stationary source of air pollution which may "contribute significantly to air pollution which causes or contributes to the endangerment of public health and welfare", under Section 111(b)(1)(A) of the Act,[5] the Administrator published a pro-

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[3] The term "new source" is defined as:

> any stationary source, the construction or modification of which is commenced after the publication of regulations (or, if earlier, proposed regulations) prescribing a standard of performance under this section which will be applicable to such source. 42 U.S.C. § 1857c-6(a)(2).

Modification is, in turn, defined as:

> any physical change in, or change in the method of operation of, a stationary source which increases the amount of any air pollutant emitted by such source, or which results in the emission of any air pollutant not previously emitted. 42 U.S.C. § 1857c-6(a)(4).

[4] 42 U.S.C. § 1857c-6(a)(1).

[5] 42 U.S.C. § 1857c-6(b)(1)(A). The designation of portland cement plant emissions was made on March 31, 1971, 36 Fed. Reg. 5931 (1971).

posed regulation establishing standards of performance for portland cement plants. The proposed regulation was accompanied by a document entitled "Background Information For Proposed New-Source Performance Standards," which set forth the justification.[6] Interested parties were afforded an opportunity to participate in the rule making by submitting comments, and more than 200 interested parties did so.[7] The "standards of performance" were adopted by a regulation, issued December 16, 1971, which requires, inter alia, that particulate matter emitted from portland cement plants shall not be:[8]

> (1) In excess of 0.30 lb. per ton of feed to the kiln (0.15 Kg. per metric ton), maximum 2-hour average.
>
> (2) Greater than 10% opacity, except that where the presence of uncombined water is the only reason for failure to meet the requirements for this subparagraph, such failure shall not be a violation of this section.

The standards were justified by the EPA as follows:[9]

> The standards of performance are based on stationary source testing conducted by the Environmental Protection Agency and/or contractors and on data derived from various other sources, including the available technical literature. In the comments on the proposed standards, many questions were raised as to costs and demonstrated capability of control systems to meet the standards. These comments have been evaluated and investigated, and it is the Administrator's judgment that emission control systems capable of meeting the standards have been adequately demonstrated and that the standards promulgated herein are achievable at reasonable costs.

On March 21, 1972, EPA published a "Supplemental Statement in Connection With Final Promulgation",[10] amplifying the justification for its standards and indicating that it had been prompted by the action of this court in Kennecott Copper Corp. v. E.P.A., 149 U.S.App.D.C. 231, 462 F.2d 846 (1972), to offer "a more specific explanation of how [the Administrator] had arrived at the standard." This statement relied principally on EPA tests on existing portland cement plants to demonstrate that the promulgated standards were achievable.

The action of the Administrator has been challenged on the following grounds: (1) The Administrator did not comply with the National Environmental Policy Act of 1969 (NEPA). (2) Economic costs were not adequately taken into account and the standards unfairly discriminate against portland cement plants, in comparison with standards promulgated for power plants and incinerators. (3) The achievability of the standards was not adequately demonstrated.

II. Compliance With NEPA

Petitioners argue that EPA acted contrary to the requirements of the National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321-35, in failing to file a "NEPA" statement in conjunction with the promulgation of the stationary standards. They draw particularly on the language of § 102(2)(C) of NEPA which states:[11]

> The Congress authorizes and directs that, to the

[6] The proposed standards were issued on August 3, 1971 and published on August 17, 1971, 36 Fed. Reg. 15,704 (1971). The Background Document, prepared by the Environmental Protection Agency, Office of Air Programs, states: "The proposed standards . . . are being distributed concurrently with this document." (JA at 20).

[7] 34 comments, specifically addressed to the Portland Cement standards, are at Tab VIII of the Certified Record (C.R.). They have been filed as a supplement to the Joint Appendix.

[8] 36 Fed. Reg. 24,876 (1971).

[9] Id. at ¶ 17.

[10] 37 Fed. Reg. 5767 (1972).

[11] 42 U.S.C. § 4332 (2) (C) (1970).

fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this chapter, and (2) all agencies of the Federal Government shall—

• • • •

(C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on—

(i) the environmental impact of the proposed action . . . .

1. Petitioners, in effect, predicate an EPA obligation to file an impact statement on this simple syllogism: (1) All federal agencies must file an impact statement; (2) EPA is a federal agency; (3) EPA must file an impact statement. Anaconda Copper Co. v. Ruckelshaus, 4 ERC 1817, 1828 (D. Col. 1972). If the premises be accepted, the logic is clear. But the argument is more simplistic than simple, for the premises require a more precise determination of legislative intent. In ascertaining congressional intent we begin with the language of a statute,[12] but this is subject to an overriding requirement of looking to all sources including purpose and legislative history, to ascertain discernible legislative purpose.[13] The question is whether EPA is a "federal agency" within the meaning of NEPA —whether, and to what extent, Congress intended it to be

[12] Caminetti v. United States, 242 U.S. 470, 485 (1917).

[13] "[T]he 'plain meaning' doctrine has always been subservient to a truly discernible legislative purpose however discerned," by equitable construction or recourse to legislative history. Wilderness Society v. Morton, Slip Opinion No. 72-1796, at 22 (Feb. 9, 1973) (en banc), *cert. denied* —— U.S. —— (1973); District of Columbia v. Orleans, 132 U.S. App. D.C. 139, 141, 406 F.2d 957, 959 (1968).

subject to the NEPA mandate concerning preparation of impact statements.

2. A primary purpose of NEPA, and specifically the impact statement requirement, was the design to co-ordinate disparate environmental policies of different federal agencies.[14] At the time NEPA was enacted, on January 1, 1970,[15] EPA was not yet in existence. EPA was created by Reorganization Plan No. 3, submitted to Congress on July 9, 1970,[16] which was designed to bring under one roof the major environmental federal programs which until that time had been scattered throughout different agencies of the government. It is by no means clear, as will appear, that NEPA's impact statement requirement was intended at time of passage of NEPA to be applicable to such environmental agencies as the National Air Pollution Control Administration of the Department of Health, Education and Welfare or the Federal Water Quality Administration of the Department of the Interior. But even assuming it was applicable to them, it does not necessarily follow that NEPA is applicable to EPA, which Congress did not have before it, and which in its own organization accomplished the purpose of coordination of environmental approach. In statutory interpretation, the courts must often, in effect, consider what answer the legislature would have made as to a problem that was neither discussed nor contemplated. Montana Power Co. v. F.P.C., 144 U.S.App. D.C. 263, 445 F.2d 739 (1970) (en banc), *cert. denied,* 400 U.S. 1013 (1971).

[14] *See* Calvert Cliffs Coordinating Committee v. AEC, 146 U.S. App. D.C. 33, 47, 449 F.2d 1109, 1123 (1971); National Resources Defense Council, Inc. v. Morton, 148 U.S. App. D.C. 5, 13, 458 F.2d 827, 835 (1972).

[15] 83 Stat. 853.

[16] The reorganization plan was effective December 2, 1970, 35 Fed. Reg. 15623 (1970). *See* 42 U.S.C. § 4321 note (1970).

3. The impact statement issue requires us to consider not only NEPA, but also the Clean Air Act and particularly the statutory scheme by which new stationary source standards are promulgated.[17]

Section 111 of the Clean Air Act establishes precise time schedules for the promulgation of new source standards.[18] The Administrator was required to publish, 90 days after December 31, 1970, a list of categories of stationary sources which "contribute significantly to air pollution which causes or contributes to the endangerment of public health or welfare." Within 120 days of the inclusion of a category, the Administrator is required to propose standards, and 90 days thereafter the standards are to go into effect. Obviously, a strong argument can be made that the Clean Air Act, and the provisions for unusual expedition in disposing of the complex environmental and other problems faced by the agency, assumed that the agency would not be subject to the additional time required to prepare a "detailed" proposal of an impact statement, circulate the statement to the agencies for comment and assess the comments made.

The time constraint of the Clean Air Act is perhaps not decisive [19] but it is a substantial consideration and, as will

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[17] In order to give full effect to the Clean Air Act, it must be read, at minimum, *in pari materia* with NEPA. *See* U.S. v. Stewart, 311 U.S. 60 (1940). There is doctrine to the effect that in case of conflict between two federal laws, the later enactment is given precedence. U.S. v. Wrightwood Dairy Co., 127 F.2d 907 (7th Cir. 1942).

[18] 42 U.S.C. § 1857c-6(b)(1).

[19] The quality of a draft impact statement might be lessened to conform to the requirements of speedy action. NEPA requires compliance only "to the fullest extent possible", 42 U.S.C. § 4332, and is subject to a construction of reasonableness. National Resources Defense Council v. Morton, 148

be seen, an inter-related aspect of that Act reinforces the conclusion that NEPA is inapplicable to determinations under it.

Long Island Lighting Company argues that the Act could accommodate delay in the time allowed for publication of the list of categories of stationary sources until an impact statement had been duly prepared, in compliance with NEPA, and completed. This is at odds with the express language of the Act which specifies that any source which contributes to the endangerment of public health or welfare shall be placed on that list at the end of 90 days.

4. As we have already indicated, there is a serious question whether NEPA is applicable to environmentally protective regulatory agencies. There is no express exemption in the language of the Act or Committee Reports.[20] However, such an exemption is set forth in a document entitled "Major Changes in S. 1075 as passed by the Senate" introduced into the Congressional Record by Senator Jackson

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U.S. App.D.C. 5, 15, 458 F.2d 827, 837 (1972). The need for timely action is not exclusive with the Environmental Protection Agency. *See* SCRAP v. United States, 346 F. Supp. 189, 199 (D.D.C. 1972) (3-judge court), *probable jurisdiction noted* 409 U.S. 1073 (1973).

A major difficulty with this approach is that it tends to result in a group of second-class impact statements, ascribed to time urgencies. In contrast, the Council on Environmental Quality has established a relatively short comment time in the interest of a uniform procedure that can accommodate even agencies on a tight time table—to avoid "a delay incompatible with the nature of some government programs." THIRD ANNUAL REPORT 237 (1972).

The crunch under the Clean Air Act is that there is no legal latitude available to delay the action, in order to give more than lip service to the comment procedure.

[20] S. REP. No. 296, 91st Cong., 1st Sess. (1969); H. REP. No. 765, 91st Cong., 1st Sess. (1969).

during debate over approval of the Conference Report.[21]

The document, in analyzing Section 102 of NEPA, detailing the procedures and requirements of an impact statement, stated that the provisions were "not designed to result in any change in the manner in which [environmental agencies] carry out their environmental protection authority". It stated immediately thereafter:

> This provision is, however, clearly designed to assure consideration of environmental matters by all agencies in their planning and decision making—especially those agencies who now have little or no legislative authority to take environmental considerations into account.[22]

Senator Muskie commented on this language as coming from his discussions with Senator Jackson, and then stated, in debate:

> It is clear then, and this is the clear understanding of the Senator from Washington [Jackson] and his colleagues, and of those of us who serve on the Public Works Committee, that the agencies having authority in the environmental improvement field will continue to operate under their legislative mandates as previously established, and that those legislative mandates are not changed in any way by section 102-5.[23]

Manifestly, the statements of these two Senators, who were among the most active in securing the passage of NEPA,[24] are entitled to weight in ascertaining legislative intent.

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[21] 115 CONG. REC. 40417 (1969).

[22] *Id.* at 40418.

[23] *Id.* at 40423.

[24] Senator Jackson, floor manager of the debate on the Conference Report, was the sponsor of the original Senate bill on NEPA, S. 1075, chaired the Senate Committee on Interior and Insular Affairs, which considered the bill, and was a member of the Conference Committee. Senator Muskie was the Chairman of the Subcommittee on Air Pollution of the Committee on Public Works.

However, their understanding was not formalized by any statement in the Conference Report or in the section-by-section analysis of the bill as reported by the Conference Committee.[25] Senator Allott, ranking minority member of the Interior Committee and of the Conference Committee, also a supporter of NEPA, stated:[26]

> . . . while the explanatory statements relative to the interpretation of the conference report language, as provided by the chairman, are useful, they have not been reviewed, agreed upon, and signed by the other Senate conferees. Only the conference report itself was signed by all the Senate conferees, and therefore, only it was agreed upon and is binding.

As for the House of Representatives, its action on the Conference Report was equally ambiguous. Representative Dingell submitted the Conference Report to the House on December 22, 1969,[27] two days after the report had been submitted to the Senate by Senator Jackson. As part of his opening remarks, Rep. Dingell introduced into the record the text of answers to certain questions posed to him by Rep. Fallon, the Chairman of the Committee on Public Works. His answer to one of those questions tracked the language of the "Major Changes" document submitted to the Senate, indicating no intended change in requirements for "environmental control" agencies.[28] There is no indication, however, of any debate or acceptance of Rep. Dingell's answer by any other member of the House.

5. We now turn to consideration of the import of subsequent congressional actions.

In the Federal Water Pollution Control Act Amendments of 1972 (FWPCA), Congress provided that NEPA did not

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[25] H.R. REP. No. 765, 91st Cong., 1st Sess. 7 (1969).

[26] 115 CONG. REC. 40422 (1969).

[27] *Id.* at 40922 (1969).

[28] *Id.* at 40925.

control certain actions taken by EPA pursuant to their water pollution control activities.[29] The question arose in debate, and is carried on by the parties to this case, as to whether this was an "exemption"—in which case the assumption would be that prior law generally intended NEPA to be applicable—or an affirmative declaration that NEPA did apply to only a limited number of EPA activities specified in the amendments. Such debate of a later Congress have been described by the Supreme Court as offering a hazardous basis for inferring the intent of the earlier Congress;[30] and this is borne out by our analysis.

Senator Muskie pointed during the 1972 debates to the Muskie-Jackson colloquy as expressing the intent to exempt EPA, and that the present legislation merely imposed some affirmative NEPA obligations, so as to narrow the exemption.[31] Others, such as Senator Nelson, clearly perceived the water pollution control amendments as, in fact, exempting EPA from NEPA.[32] Senator Jackson had doubts by 1972, as to the wisdom of his prior position on a broad exemption for "environmental control" agencies.[33]

6. The matter resolves itself, as to this issue of exemption for environmental agencies, that we have items which are entitled to some weight as indicia of legislative intent, but cannot be taken as decisive.[34] It becomes appropriate,

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[29] Pub. L. No. 92-500, 86 STAT. 816 (1972). Section 511(c)(1) provides that NEPA is not applicable to EPA, at least as to impact statements, except in two cases: where grants are made for the construction of publicly owned waste treatment works and where the agency issues new source permits.

[30] United States v. Southwestern Cable Co., 392 U.S. 157, 170 (1968).

[31] 118 CONG. REC. 16877-78 (daily ed., Oct. 4, 1972). Senator Muskie also referred to an intervening interpretation of the Council on Environmental Quality that EPA was exempt from NEPA, 36 Fed. Reg. 7724 (1971) § 5(d). This CEQ interpretation as to EPA, reflected its earlier view that the Federal Water Quality Administration and the National Air Pollution Control Board were exempt from NEPA, 35 Fed. Reg. 7391 (1970) § 5(d). The CEQ view was based on its reading of the legislative history of NEPA, which we find highly ambiguous, and cannot therefore assign this administrative determination controlling weight. At least part of the deference assigned to administrative construction of a statute, concerns the passage of time under which the agency view has become an accepted interpretation and in which the Congress has not acted to nullify the agency practice. Deference may also be accorded an administrative interpretation to avoid dislocation where agencies have shaped their actions in accordance with the interpretation, and the court concludes that the interpretation is not inconsistent with discernible legislative intention. Here, however, the issue of meaning turns on statutory wording and legislative history, available in extenso to the court, and not affected by any considerations of special technical expertise of CEQ, which might lead to extra deference. *See* Wilderness Society v. Morton, *supra*, Slip Opinion at 40-51, for discussion of deference to be given administrative construction of statutes. We note that CEQ, in its latest Proposed Guidelines for Preparation of Environmental Impact Statements, 38 Fed. Reg. 10856, 10865 (1973), has retracted § 5d and its broad claim that EPA was exempt from all NEPA requirements. We do not reach the question as to the scope of authority of the Council on Environmental Quality to interpret the requirements of the Act.

[32] Senator Buckley viewed section 511(c)(1) as a provision "which grants broad exemptions", 118 CONG. REC. S16884 (daily ed., Oct. 4, 1972). Senator Nelson stated: "While this section [511(c)(1)] does specifically authorize some exemptions from the environmental policy act to avoid conflict with other key environmental aims, the reach of these exemptions would appear to be narrow." *Id.* at 16888.

[33] *Id.* at 16886-88.

[34] *Compare* United States v. Thompson, 147 U.S. App.D.C. 1, 13, 452 F.2d 1333, 1345 (1971), *cert. denied*, 405 U.S. 998 (1972). *Also see* Calvert Cliffs, *supra*, 146 U.S. App.D.C. at 49-50, 449 F.2d at 1125-26.

then,[35] to consider the policies underlying the legislation.[36] Here, again, we encounter competing considerations reflecting the difficulty in resolving the question; but perhaps they point the way toward a resolution.

The policy thrust toward exemption of the environmental agency is discernible from these factors, taken in combination: (1) An exemption from NEPA is supportable on the basis that this best serves the objective of protecting the environment which is the purpose of NEPA. (2) This comes about because NEPA operates, in protection of the environment, by a broadly applicable measure that only provides a first step. The goal of protecting the environment requires more than NEPA provides, i.e. specific assignment of duties to protection agencies, in certain areas identified by Congress as requiring extra protection. (3) The need in those areas for unusually expeditious decision would be thwarted by a NEPA impact statement require-

[35] We think little guidance to the resolution of this issue is to be obtained from consideration of section 309 of the Clean Air Act, 42 U.S.C. § 1857h-7, which petitioners greatly relied on during oral argument of this case. That section merely requires the Administrator to review and comment in writing on the impact on the environment of projects of another federal agency "which contains any matter related to duties and responsibilities granted [to the Administrator] pursuant to this chapter." The contention that this section implies the Administrator must file a draft impact statement can only be resolved in the framework of the legislative history which we have already reviewed.

[36] *See* United States v. Sisson, 399 U.S. 267, 297-98 (1970), where Justice Harlan stated: "The axiom that courts should endeavor to give statutory language that meaning that nurtures the policies underlying legislation is one that guides us when circumstances not plainly covered by the terms of the statute are subsumed by the underlying policies to which Congress was committed." *Also see* District of Columbia v. Orleans, *supra*, 132 U.S. App.D.C. at 140-41, 406 F.2d at 958-59.

ment.[37] (4) An impact statement requirement presents the danger that opponents of environmental protection would use the issue of compliance with any impact statement requirement as a tactic of litigation and delay.[38]

The policies against a NEPA exemption embrace the endemic question of "Who shall police the police"? As Senator Jackson stated, "It cannot be assumed that EPA will always be the good guy."[39] Concern was also voiced by petitioners in this case that EPA might wear blinders when promulgating standards protecting one resource as to effects on other resources, as is asserted in this case, that air standards may increase water pollution. Finally, it is argued that a NEPA statement's procedures, though burdensome, allow for needed input by other federal agencies and simultaneously open up the decision-making process to scrutiny by the public.[40]

[37] Senator Muskie stated, during the debate on the applicability of NEPA statements to EPA, pursuant to the FWPCA amendments of 1972, 118 CONG. REC. 16878 (daily ed., Oct. 4, 1972): "If the general procedural or substantive reforms achieved in NEPA . . . were permitted to override, supersede, broaden, or affect in any way the more specific environmental mandate of the FWPCA, the administration of the Act would be seriously impeded and the intent of Congress in passing it frustrated." For problems in complying with both NEPA and the Clean Air Act's requirements for speedy action, *see* note 19 *supra*

[38] *Id.*

[39] *Id.* at 16887. Senator Jackson raised this pointed concern: "Since EPA was formed, they have done an admirable job and they are continuing to do so, at least for the present. However, it cannot be forgotten that EPA is a regulatory agency and in the past in Washington almost all regulatory agencies have eventually come under the control of those that they are charged with regulating," quoting from the September 22, 1972 National Wildlife Federation Conservation Report.

[40] *Id.* (Statement of Senator Jackson). We do not think that

7. Our consideration of the complex questions raised by a broad exemption claim, reinforce our conclusion that these should not be decided in the present case, which may appropriately be determined upon the logic of a narrow exemption from NEPA applicable to determinations under section 111 of the Clean Air Act. What is decisive, ultimately, is the reality that, section 111 of the Clean Air Act, properly construed, requires the functional equivalent of a NEPA impact statement. Thus in this case, as in International Harvester v. Ruckelshaus, Slip Opinion No. 72-1517 (D.C. Cir., February 10, 1973), at 62 n.130,[41] we refrain from a determination of any broader claim of NEPA exemption.

Enlarging on our conclusion as to a narrower exemption, we note that section 111 of the Clean Air Act requires a

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the post-decision reporting requirements of the Clean Air Act to Congress, pursuant to sections 312(a) and 313 of the Act, 42 U.S.C. § 1857j-1, 2 (1970), offer the same timely and substantive impact on decision making as would comments on possible adverse environmental impact during a rule-making proceeding. Section 312(a) calls for "Comprehensive economic cost studies", and EPA has already issued its first required report, which includes a discussion of portland cement. S. Doc. No. 92-67, Annual Report of the Administrator, The Economics of Clean Air, 92d Cong., 2d Sess. 4-36-43 (1972), which is based largely on a study made for the purpose of arriving at the promulgated standard and introduced into the rule-making record. ELIAS, J. R. AND J. M. DEMENT, THE FINANCIAL IMPACT OF AIR POLLUTION CONTROL UPON THE CEMENT INDUSTRY (1971) (prepared for EPA) (hereinafter FINANCIAL IMPACT). C. R. TabV(f).

Section 313 of the Act requires, inter alia, a report on "the development of air quality criteria and recommended emission control requirements." Two reports have already issued. S. Doc. 92-66, Annual Report of the Administrator of the Environmental Protection Agency, Progress in the Prevention and Control of Air Pollution, 92 Cong., 2d Sess. (1972); S. Doc. 92-11, 92 Cong., 1st Sess. (1971 Annual Report). Both reports are summary in nature, and neither discusses portland cement.

It is, therefore, apparent that Congress receives no required information about the possible adverse environmental impact of proposed standards for new stationary sources.

[41] To date, only a few cases have dealt with the application of NEPA to EPA. In Getty Oil Co. (Eastern Operations) v. Ruckelshaus, 467 F.2d 349 (3rd Cir. 1972), *cert. denied* 409 U.S. 1125 (1973), the issue was raised in the context of an enforcement proceeding by EPA of Delaware's approved implementation plan under § 110 of the Clean Air Act. Petitioners argued that the failure to file an impact statement rendered the compliance order ultra vires. The Third Circuit held that this objection was improperly raised in an enforcement proceeding, thus not reaching the question, though noting that authority for application was "not persuasive", *citing* Kalur v. Resor, 335 F.Supp. 1 (D.D.C. 1971).

In *Kalur*, the court held that the Corps of Engineers was required to issue an impact statement before granting a permit to dump "refuse" into navigable waters, pursuant to its administration of the Rivers and Harbors Act of 1899, 33 U.S.C. § 407 (1971). This decision was partly responsible for the FWPCA Amendments of 1972, giving EPA authority over the issuance of discharge permits, and exempting issuance from NEPA. Pub. L. No. 92-500, 86 Stat. 814 (1972). *See* statement of Senator Hart, 118 CONG. REC. 16890 (daily ed. Oct. 4, 1972). *Kalur* was subsequently dismissed as moot on appeal to this court by order, following the enactment of the new legislation, and is of no precedential value.

The case most directly on point is Anaconda Copper Co. v. Ruckelshaus, 4 E.R.C. 1817 (D. Colo. 1972). That case dealt with the ability of Anaconda's copper smelter, which emitted sulphur oxides, to conform with EPA standards under § 110 of the Clean Air Act. After the Governor of the State of Montana had deleted that portion of the State plan, relating to these emissions—which affected only Anaconda—EPA proposed its own standards. After administrative hearings, Anaconda brought suit in the district court to enjoin promulgation of the rule. The district court held that more than the

"standard of performance" which reflects "the best system of emission reduction", and requires the Administrator to take "into account the cost of achieving such reduction." These criteria require the Administrator to take into account counter-productive environmental effects of a proposed standard, as well as economic costs to the industry. The Act thus requires that the Administrator accompany a proposed standard with a statement of reasons that sets forth the environmental considerations, pro and con which have been taken into account as required by the Act, and

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minimal due process required in rule-making proceedings should have been afforded at the EPA hearing since the regulation, in effect, applied only to Anaconda, that there was insufficient evidence to support the standards, and that EPA should have been required to file an impact statement pursuant to NEPA. Leaving aside the threshold question as to whether the district court properly took jurisdiction of the proposed rule, *see* Environmental Defense Fund et. al. v. Ruckelshaus, Slip Opinion No. 72-1548 (D.C. Cir., filed March 30, 1973), we think the thrust of the district court's concern, which we share, was the seeming refusal of the EPA to take into account possible adverse impact on water quality which might arise from its air standards. This problem was "not studied or considered by the Administrator" according to the findings of fact of the district court. This concern could have been reflected in a requirement that information be developed on this point in conjunction with the hearings on the standard, but instead the court chose to enjoin the rule on the basis of the failure to file an impact statement. We think the examination of support for this holding was myopic, and rested heavily on the logic of the words "all federal agencies" which, as we have indicated *infra*, text at notes 12, 13, is only itself dependent on the non-obvious premise that EPA is a "federal agency" within the meaning of NEPA.

See also Appalachian Power Co. v. EPA, 5 ERC 1222 (4th Cir. 1973) and Duquesne Light Co. v. EPA, Slip Opinion No. 72-1542 (3rd Cir., filed April 2, 1973) holding NEPA inapplicable to actions of Administrator in approving state implementation plan under § 110 of the Clean Air Act.

fulfillment of this requirement is reviewable directly by this Court.[42]

Although the rule-making process may not import the complete advantages of the structured determinations of NEPA into the decision-making of EPA, it does, in our view strike a workable balance between some of the advantages and disadvantages of full application of NEPA. Without the problems of a NEPA delay conflicting with the constraints of the Clean Air Act, the ability of other agencies to make submissions to EPA concerning proposed rules, provides a channel for informed decision-making. These comments will be part of the record in the rule-making proceeding that EPA must take into account.[43]

EPA's proposed rule, and reasons therefor, are in-

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[42] One of the major reasons Senator Muskie offered for not generally applying NEPA to EPA water pollution control activity, during the FWPCA amendments debate of 1972, was that the Federal Water Pollution Control Act "specifically identifies factors to be considered by the Administrator". 118 CONG. REC. 16878 (daily ed. Oct. 4, 1972). The standard of the "best system" is comprehensive, and we cannot imagine that Congress intended that "best" could apply to a system which did more damage to water than it prevented to air.

[43] This approach avoids the straitjacket that NEPA would impose on the time requirements mandated by the Clean Air Act. EPA would have 120 days to issue, as part of its reasons, its consideration of possible adverse environmental effects, along with its proposed standard. This need not be the "detailed" statement required by NEPA. We would expect, however, that all documents which supported its conclusion on this question be made available for comment. Standard CEQ guidelines, or those of the Environmental Protection Agency, for circulation of impact statements could be adapted to provide for circulation to other federal agencies of the statement of reasons and supporting documents. Time allowed for comment would be made to depend on the strict time requirements of the section 111 proceeding.

evitably an alert to environmental issues. The EPA's proposed rule and reasons may omit reference to adverse environmental consequences that another agency might discern, but a draft impact statement may likewise be marred by omissions that another agency identifies. To the extent that EPA is aware of significant adverse environmental consequences of its proposal, good faith requires appropriate reference in its reasons for the proposal and its underlying balancing analysis. While there is more flexibility than NEPA's requirement of an impact statement, this court has stated, and EPA has recognized, that an EPA statement of reasons for standards and criteria require a fuller presentation than the minimum rule-making requirement of the Administrative Procedure Act. *Kennecott Copper* v. *EPA, supra.*

Similarly, EPA's proposed rule, and reasons therefor, are an alert to the public and the Congress who will have the opportunity to comment as to possible adverse environmental effects of the proposed rule, during the pendency of the rule making proceeding. And finally, the courts will be able to scrutinize the analysis of environmental considerations, in assuring that a reasoned decision has been reached.[44]

The court's review guards against arbitrary disregard of environmental factors by EPA without significantly increasing the administrative burden on the agency. And since all environmental questions will have to be considered within the same review proceeding as other challenges to the validity of standards, the potential for incremental litigation delay is minimized.

[44] The combination of reasons relating to possible adverse environmental impact with those justifying the standards generally, directs the attention of the reviewing court to the "reasoned basis" which supports the rule as a whole, rather than permiting challenges based on particular *per se* violations of NEPA.

As to the standard here at issue, petitioners raise possible adverse environmental impact questions in their briefs.[45] But they have not indicated that these problems were brought to the attention of the agency. Since we are remanding the case for other reasons subsequently discussed, EPA should respond to these questions on remand.

We add, finally, a word of clarification: we establish a narrow exemption from NEPA, for EPA determinations under section 111 of the Clean Air Act. NEPA must be accorded full vitality as to non-environmental agencies, as established by our outstanding precedents.[46]

III. Economic Costs

The objecting companies contend that the Administrator has not complied with the mandate of § 111 of the Act, which requires him to "[take] into account the cost" of achieving the emission reductions he prescribes, a statutory provision that clearly refers to the possible economic impact of the promulgated standards.[47] The nature of

[45] Petitioner Portland Cement Association asserts in its Brief at 34:

> Increased electricity needed to operate precipitators with greater collection capacity can create increased air pollution by the source of the electricity. Also, stricter standards will result in the collection of more particulates. These must be disposed of somehow.
>
> The alkaline content of cement must be limited and, since much of the collected particulate is substantially alkaline, it cannot be used in production but must be discarded. This waste is usually combined with water and may cause alkaline pollution through direct discharge or the seepage of percolating waters into streams and rivers. Currently Petitioner is discussing with E.P.A. a study to determine what can be done to reduce or avoid this result.

[46] Calvert Cliffs, *supra.*

[47] An amendment which would have deleted consideration

these cost and economic contentions is such that it is possible, and we find it convenient, to consider them now, before describing the industry's processes, which will be presented below in the consideration of other issues.

The Administrator found in the Background Document that, for a new wet-process plant with a capacity of 2.5 million barrels per year, the total investment for all installed air pollution control equipment will represent approximately 12 percent of the investment for the total facility. He also found that "[a]nnual operating costs for the control equipment will be approximately 7 percent of the total plant operating costs if a baghouse is used for the kiln, and 5 percent if an electrostatic precipitator is used." [48]

Petitioners argue that this analysis is not enough—that the Administrator is required to prepare a quantified cost-benefit analysis, showing the benefit to ambient air conditions as measured against the cost of the pollution devices. However desirable in the abstract, such a requirement would conflict with the specific time constraints imposed on the Administrator. The difficulty, if not impossibility, of quantifying the benefit to ambient air conditions,[49] further militates against the imposition of such an imperative on

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of economic impact was proposed by Congressman Ryan of New York, who stated:

> I believe that the threat to our environment is so great that, as a matter of public policy, industry should be required to use the most advanced technology regardless of whether or not a particular industry finds it economically feasible.

This amendment was rejected on voice vote. 116 CONG. REC. 19242-43 (1970).

[48] JA at 50.

[49] *See* Note, *Cost-Benefit Analysis and the National Environmental Policy Act of 1969*, 24 STANF. L. REV. 1092, 1098ff (1972), and authorities cited therein.

the agency. Such studies should be considered by the Administrator, if adduced in comments, but we do not inject them as a necessary condition of action.

The EPA contention that economic costs to the industry have been taken into account, derives substantial support from a study prepared for EPA, which was made part of the rule-making record and referred to in the Background Document, entitled "The Financial Impact of Air Pollution Control Upon the Cement Industry".[50] It concluded that the additional costs of control equipment could be passed on without substantially affecting competition with construction substitutes such as steel, asphalt and aluminum, because "[d]emand for cement, derived for the most part from demand for public and private construction, is not highly elastic with regard to price and would not be very sensitive to small price changes." The study did note that individual mills may be closed in the years ahead, but observed that these plants were obsolete both from a cost and pollution point of view. Petitioners have not challenged these findings here. The Administrator has obviously given some consideration to economic costs.

2. Two questions related to economic considerations remain: (1) the possible effect of the standards on the future building of wet-process plants generally, and the use of electrostatic precipitators as a control device; and (2) possible unfair discrimination between standards set for cement plants, and those set for power plants and incinerators.

As appears from our examination of technological feasibility, in Part IV of this opinion, a substantial question arises as to whether either wet process plants, or any process using electrostatic precipitators, will be able to achieve mandated pollution control. The HEW Atmospheric

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[50] FINANCIAL IMPACT, *supra* note 40, at 42.

Emissions Study, relied on by EPA, reported that as of 1967 there were 110 wet process and 69 dry process plants in the United States, and that they were "expected to increase at a comparable rate." [51] As to exclusion of electrostatic precipitators, the record shows that they are a cheaper technology than fabric filters. Since remand is required for other reasons, as appear from Part IV, we confine our analysis at this juncture to a declaration that on remand the Administrator should consider, as a matter of economic costs, contentions and presentations submitting that the standard as adopted unduly precludes supply of cement, including whether it is unduly preclusive as to certain qualities, areas, or low-cost supplies.

3. Petitioners also challenge the cement standards as unfair in light of lower standards mandated for fossil-fuel-fired steam generating power plants and incinerators.[52] They claim that while the cement standard, as expressed in grains of particulates allowed per standard cubic foot of gas (g/scf), requires a reduction to .03,[53] power plants are permitted to reach .12 and incinerators to be at .10. Also opacity standards differ, with no opacity standard set for

[51] KREICHELT, T. E., KEMNITZ, D. A., AND CUFFE, S. T., ATMOSPHERIC EMISSIONS FROM THE MANUFACTURE OF PORTLAND CEMENT, U.S. Dept. HEW, PHS, National Center for Air Pollution Control, PHS Publication No. 999-AP-17 (1967) (hereinafter ATMOSPHERIC EMISSIONS), at 6.

[52] These standards were proposed jointly with those of portland cement, 36 Fed. Reg. 15704 (1971), and were adopted at the same time, 36 Fed. Reg. 24876 (1971). The standards for fossil fuel steam generators are challenged in appeal to this court in Appalachian Power Co. v. EPA, Docket No. 72-1079.

[53] The promulgated standards for cement, expressed in particulate levels measured against pounds per ton of feed to the kiln, are convertible, for purposes of comparison, into grains of particulates per standard cubic foot of gas.

incinerators, and with a 20% requirement for power plants (with 40% opacity permitted for not more than 2 minutes in any hour).

First, we identify petitioner's mistake in attaching any weight to a comparison of the proposed standards, whereas the standards as finally adopted permitted pollution standards of only .08 for incinerators and .10 for power plants, compared with .03 for cement plants.

EPA, in response to comments from petitioners on this issue of discrepancy, stated in its supplemental statement in March 1972: "The difference between the particulate standard for cement plants and those for steam generators and incinerators is attributable to the superior technology available therefor (that is, fabric filter technology has not been applied to coal-fired steam generators or incinerators)." [54]

This statement seems to be supported by the Background Document.[55] It suggests that there has indeed been a dif-

[54] 37 Fed. Reg. 5767 (1972). We also note that EPA disagreed with petitioners as to the relevant numbers to compare. EPA stated that the power plant standard was "0.06 grains per standard cubic foot at normal excess air rates", and that the incinerator standard, while .08 "corrected to 12 percent carbon dioxide", was .05 "[u]ncorrected, at normal conditions of 7.5 percent carbon dioxide."

[55] The August 1971 Background Document was used to support the incinerator and power plant standards, as well as cement standards. The statement is subject to the amplification (JA 29) that fabric filters "are scheduled to be installed" at a power station, though "no full scale fabric filters have been demonstrated on coal fired steam generators." As to munnicipal incinerators, the Document refers to a "small Swiss unit" with a fabric filter tested with European sampling procedures, to lower emission in a "small pilot installation" operated by Pasadena in 1960, and to incinerators (over 50 tons per day) equipped with baghouses that "will be put into service in late 1971 in the United States and Switzerland."

ference in the extent of application of fabric filter technology to cement plants, on the one hand, and power plants and incinerators on the other, although we are not informed by the Administrator as to what characteristics of the concerned industries might account for such differences.

This March 1972 statement of the Administrator was made in response to comments of the cement producers, and was not offered as justification for the cement standards, which were based solely on emission control available to that industry. Petitioners did not identify this part of the March 1972 supplemental statement as troublesome when they sought a remand from this court on other points. However, this is more a matter of atmosphere than dispositive ruling, for if the producers now gave significant indication that they had been dealt with unfairly or invalidly we could doubtless find a procedural path for consideration.

The core of our response to petitioners is that the Administrator is not required to present affirmative justifications for different standards in different industries. Inter-industry comparisons of this kind are not generally required, or even productive; and they were not contemplated by Congress in this Act. The essential question is whether the mandated standards can be met by a particular industry for which they are set, and this can typically be decided on the basis of information concerning that industry alone. This is not to say that evidence collected about the functioning of emission devices in one industry may not have implications for another. Certainly such information may bear on technological capability. But there is no requirement of uniformity of specific standards for

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(JA at 40, 41). If the same technology is now available and in use for incinerators, steam power plants and cement plants, the Administrator on remand may wish to offer some further explanation of the difference in standards set simultaneously for the three industries.

all industries. The Administrator applied the same general approach, of ascertaining for each industry what was feasible in that industry. It would be unmanageable if, in reviewing the cement standards, the court should have to consider whether or not there was a mistake in the incinerator standard, with all the differences in parties, practice, industry procedures, and record for decision. Of course, the standard for another industry can be attacked, as too generous, and hence arbitrary or unsupported on the record, by those concerned with excessive pollution by that industry. There is, therefore, an avenue of judicial review and correction if the agency does not proceed in good faith to implement its general approach. But this is different from the supposition that a claim to the same specific treatment can be advanced by one who is in neither the same nor a competitive industry.

There is, of course, a significant and proper scope for inter-industry comparison in the case of industries producing substitute or alternative products. This bears on the issue of "economic cost". But this comparison was utilized in arriving at the agency decision, and no contention is raised in this court that such competitive-industry impact was either ignored or assessed invalidly.

IV. Achievability of Emission Standard

Section 111 of the Act requires "the degree of emission limitation achievable [which] . . . the Administrator determines has been adequately demonstrated." Petitioners contend that the promulgated standard for new stationary sources has not been "adequately demonstrated", raising issues as to the interpretation to be given to this requirement, the procedures followed by the agency in arriving at its standard, and the scientific evidence upon which it was formulated. An examination of these questions requires a brief description of the process used to manufac-

ture portland cement and the devices presently employed to control emissions.

A. *Present types of Emission Control in the Manufacture of Portland Cement*

In the manufacturing process for portland cement,[56] the principal ingredients, limestone and clay, are combined, after having been reduced to a powdery fineness, to make a substance known as raw feed. The powdered limestone and clay are mixed by either the wet process or the dry process. In the wet process, water is added to the limestone and clay to make a slurry, which is then introduced into a kiln. In the dry process, the two substances are mixed mechanically and by use of air before the mix is introduced into a kiln.

Raw feed is introduced to the kiln at ambient air temperature and is then heated to a temperature of about 2700° Fahrenheit, produced within the kiln by the use of various fuels. The emission standards under challenge here relate solely to the control of particulate matter produced by the kiln operation.

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[56] The following description of the manufacturing process is based on ATMOSPHERIC EMISSIONS, *supra* note 51, and the Affidavit of Ralph H. Striker, a professional engineer, sworn on June 9, 1972. C.R., Tab IX, at 1. Striker described his background as follows:

> Since 1938 I have been engaged in various process phases of the cement industry; my professional specialty is the chemistry of portland cement manufacture, including process design and related instrumentation control. Within the scope of my specialty is the chemical processes occurring in the manufacture of portland cement and emissions and gas emanating therefrom. Presently I am Vice President of Bendy Engineering Company, St. Louis, Missouri, where I have participated in the design from a basic process standpoint of not less than ten kilns in the last ten years.

The kiln operation involves the chemical process known as calcining limestone; carbon dioxide is driven from the limestone, converting calcium carbonate ($CaCO_3$) into calcium oxide (CaO), ($CaCO_3$ yields $C0_2$ + Ca0). The calcium oxide later combines with the clay to form a substance known as "clinker", the basic component of cement. The calcination process produces gases and dust as by-products. The particulate matter is suspended in the hot exhaust gas and the various types of emission control devices remove this matter from the gas, before it is emitted into the atmosphere through a stack.

The two types of equipment principally used in removing particulate matter from the exhaust gas are electrostatic precipitators and glass fabric bags, impregnated with graphite, located in a "bag house." When the precipitator is used, dust particles are charged and pass through an electrical field of the opposite charge, thus causing the dust to be precipitated out of the exhaust gas and thereafter collected by the device. When glass fabric bags are used, the exhaust gas is cooled, sometimes by a water spray, so that the bags will operate without damage from excessive heat. The bag filters out the particulate dust, though sometimes the coolant combines with the dust to form a gummy substance as residue in the bags, which must be continuously cleaned out in order to avoid impairing the permeability of the bag.

It is the ability of control devices such as precipitators and bags to separate out a sufficient amount of particulate from the exhaust—in accord with the proposed standards —which is under challenge by the manufacturers. The standard requires that the particulate matter emitted from portland cement plants not be "in excess of 0.30 lb. per ton of feed to the kiln . . . maximum 2-hour average".

B. *Technology Available For New Plants*

We begin by rejecting the suggestion of the cement

manufacturers that the Act's requirement that emission limitations be "adequately demonstrated" necessarily implies that any cement plant now in existence be able to meet the proposed standards. Section 111 looks toward what may fairly be projected for the regulated future, rather than the state of the art at present, since it is addressed to standards for new plants—old stationary source pollution being controlled through other regulatory authority.[57] It is the "achievability" of the proposed standard that is in issue.

The language in section 111 was the result of a Conference Committee compromise, and did not incorporate the language of either the House or Senate bills.[58] The House bill would have provided that "the Secretary . . . [give] appropriate consideration to technological and economic feasibility", while the Senate would have required that standards reflect "the greatest degree of emission control which the Secretary determines to be achievable through application of the latest available control technology, processes, operating methods, or other alternatives."

The Senate Report made clear that it did not intend that the technology "must be in actual routine use somewhere."[59] The essential question was rather whether the technology would be available for installation in new plants. The House Report also refers to "available" technology. Its caution that "[i]n order to be considered 'available' the technology may not be one which constitutes a purely theoretical or experimental means of preventing or controlling air pollution"[60] merely reflects the final language adopted, that it must be "adequately demonstrated" that there will be "available technology".

The resultant standard is analogous to the one examined in *International Harvester, supra.* The Administrator may make a projection based on existing technology, though that projection is subject to the restraints of reasonableness and cannot be based on "crystal ball" inquiry. Slip Opinion at 18. As there, the question of availability is partially dependent on "lead time", the time in which the technology will have to be available. Since the standards here put into effect will control new plants immediately, as opposed to one or two years in the future, the latitude of projection is correspondingly narrowed. If actual tests are not relied on, but instead a prediction is made, "its validity as applied to this case rests on the reliability of [the] prediction and the nature of [the] assumptions." *International Harvester* at 45.

C. *Right to Comment on EPA Methodology*

We find a critical defect in the decision-making process in arriving at the standard under review in the initial inability of petitioners to obtain—in timely fashion—the test results and procedures used on existing plants which formed a partial basis for the emission control level adopted, and in the subsequent seeming refusal of the agency to respond to what

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[57] Under §§ 109-110, 42 U.S.C. § 1857c-4, 5, of the Clean Air Act the Administrator sets national primary and secondary ambient air standards relating to required air quality for each air pollutant. States must draw up a plan to comply with such standards, which in turn must be approved by EPA. These ambient air standards relate to pollution from any source, whether it be old or new, stationary or moving, but specific new or modified stationary sources are only regulated directly under § 111.

[58] The Conference Committee considered S.4358, 91st Cong., 2d Sess., 113 (1970) and H.R. 17255, 91st Cong., 2d Sess. sec. 112 (1970). The Report of the Conference does not discuss the language finally adopted, H. REP. No. 91-1783, 91st Cong., 2d Sess. 9, 45 (1970).

[59] S. REP. No. 9-1196, 91st Cong., 2d Sess. 16 (1970).

[60] H. REP. No. 91-1146, 91st Cong., 2d Sess. 10 (1970).

seem to be legitimate problems with the methodology of these tests.

1. Unavailability of Test Methodology

The regulations under review were first proposed on August 3, 1971 and then adopted on December 16, 1971. Both the proposed and adopted rule cited certain portland cement testing as forming a basis for the standards. In the statements accompanying the proposed rule, the Administrator stated:[61]

> The standards of performance set forth herein are based on stationary source testing conducted by the Environmental Protection Agency and/or contractors . . . .

On December 16, this test reliance was reiterated:[62]

> The standards of performance are based on stationary source testing conducted by the Environmental Protection Agency and/or contractors . . . .

As indicated in the earlier statement of the case, the proposed standard was accompanied by a Background Document which disclosed some information about the tests, but did not identify the location or methodology used in the one successful test conducted on a dry-process kiln. Further indication was given to petitioners that the Administrator was relying on the tests referred to in the Background Document, when the statement of reasons accompanying the adopted standard were expanded in mid-March of 1972, in the supplemental statement filed while this case was pending on appeal to our court. The Administrator there stated:[63]

> The proposed standard was based principally on particulate levels achieved at a kiln controlled by a fabric filter.

For the first time, however, another set of tests was referred to, as follows:

> After proposal [of the regulation], but prior to promulgation a second kiln controlled by a fabric filter was tested and found to have particulate emissions in excess of the proposed standard. However, based on the revised particulate test method, the second installation showed particulate emissions to be less than 0.3 pound per ton of kiln feed.

These two testing programs were referred to in the March 1972 supplemental statement, but the details, aside from a summary of test results, were not made available to petitioners until mid-April 1972. At that time, it was revealed that the first set of tests was conducted April 29-30, 1971, by a contractor for EPA, at the Dragon Cement Plant, a dry process plant in Northampton, Pennsylvania, and that the second set was performed at the Oregon Portland Cement plant, at Lake Oswego, Oregon, a wet process plant, on October 7 and 8, 1971. The full disclosure of the methodology followed in these tests raised certain problems, in the view of petitioners, on which they had not yet had the opportunity to comment. Their original comments in the period between the proposal and promulgation of the regulation could only respond to the brief summary of the results of the tests that had been disclosed at that time.

After intervenor Northwestern States Portland Cement Company received the detailed test information in mid-April 1972, it submitted the test data, for analysis of reliability and accuracy, to Ralph H. Striker, an engineer experienced in the design of emission control systems[64] for portland cement plants. He concluded that the first series of tests run at the Dragon Cement Company were "grossly

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[61] 36 Fed. Reg. 15704 (1971).

[62] 36 Fed. Reg. 24876 (1971).

[63] 37 Fed. Reg. 5767 (1972).

[64] *See* note 56 *supra*.

erroneous" due to inaccurate sampling techniques to measure particulate matter.[65] Northwestern States then moved this Court to remand the record to EPA so that the agency might consider the additional comments on the tests. This motion was granted on October 31, 1972.[66] This action by the Court was based on "the flexibility and capacity for reexamination that is rooted in the administrative process". *International Harvester,* Slip Op. at 25. We considered this opportunity to make further comments necessary to sound execution of our judicial review function.[67]

We are aware that EPA was required to issue its standards within 90 days of the issuance of the proposed regulation, and that this time might not have sufficed to make an adequate compilation of the data from the initial tests, or to fully describe the methodology employed. This was more likely as to the second tests, which were begun during the pendency of the proposed regulation. In contrast, more than three months intervened between the conduct of the first tests and the issuance of the proposed regulation. Even as to the second tests however, as we indicated in *International Harvester,* which involved the issue of the availability of the Technical Appendix upon which the auto emission suspension decision was based, the fact that the agency chose to perform additional tests and release the results indicates that it did not believe possible agency consideration was frozen. Slip opin. at 26. It is not consonant with

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[65] C.R. Tab IX, Striker Affidavit at 2.

[66] A motion of similar effect was granted as to petitioner-intervenor Medusa Corp. to make additional presentations to the agency, on June 23, 1972.

[67] Written comments were submitted as requested, and as required by the APA § 4(c), 5 U.S.C. § 553(c). Obviously a prerequisite to the ability to make meaningful comment is to know the basis upon which the rule is proposed.

the purpose of a rule-making proceeding to promulgate rules on the basis of inadequate data, or on data that, critical degree, is known only to the agency.

2. The EPA response to the Remand

In this case, EPA made no written submission as to the additional comments made by petitioners. Our remand was ordered, as to Northwestern, on October 31, 1972. All that EPA did was to comply with the mandate that the analysis of Mr. Striker be added to the certified record. It may be that EPA considers Mr. Striker's analysis invalid—but we have no way of knowing this. As the record stands, all we have is Mr. Striker's repudiation of the test data, without response. The purpose of our prior remand cannot be realized unless we hear EPA's response to his comments, and the record must be remanded again, for that purpose.

We are not establishing any broad principle that EPA must respond to every comment made by manufacturers on the validity of its standards or the methodology and scientific basis for their formulation. In the case of the Striker presentation, however, our prior remand reflects this court's view of the significance, or at least potential significance, of this presentation. If this were a private lawsuit, we might reverse the order under appeal for failure of its proponent to meet the burden of refutation or explanation. Since this is a matter involving the public interest, in which the court and agency are in a kind of partnership relationship for the purpose of effectuating the legislative mandate, we remand. This agency, particularly when its decisions can literally mean survival of persons or property, has a continuing duty to take a "hard look" at the problems involved in its regulatory task, and that includes an obligation to comment on matters identified as potentially significant by the court order remanding

for further presentation. Manufacturers' comments must be significant enough to step over a threshold requirement of materiality before any lack of agency response or consideration becomes of concern. The comment cannot merely state that a particular mistake was made in a sampling operation; it must show why the mistake was of possible significance in the results of the test. This was certainly done by Mr. Striker, who on the basis of some extensive mathematical calculations stated:

> It is my personal opinion that the particulate matter emissions of .202 pounds in test 1 per ton of kiln feed reported in the summary sheet on Page vii and again on Page 6 of Exhibit 4-A is grossly erroneous, and that the correct emission of particulate matter is in the neighborhood of .404 pounds per ton of kiln feed.

In order that rule-making proceedings to determine standards be conducted in orderly fashion, information should generally be disclosed as to the basis of a proposed rule at the time of issuance. If this is not feasible, as in case of statutory time constraints, information that is material to the subject at hand should be disclosed as it becomes available, and comments received, even though subsequent to issuance of the rule—with court authorization, where necessary. This is not a requirement that the rule be suspended, though the court may consider an application for stay based on probability of success and furtherance of the public interest. Virginia Petroleum Jobbers v. F.P.C., 104 U.S.App.D.C. 106, 259 F.2d 921 (1958).

Conversely, challenges to standards must be limited to points made by petitioners in agency proceedings. To entertain comments made for the first time before this court would be destructive of a meaningful administrative process.

There are claims made in this court which were not presented to EPA. For example, petitioner Portland Cement

Association states in its brief,[68] in regard to the first set of tests at the Dragon Cement Plant:

> Mistakes and conditions occurred which prevented the test from using *observed, measured* values. Encrusted solids were thought to cause a high reading in Run 1 so lower readings from other tests were substituted. The area of a duct was calculated rather than measured due to the presence of deposits. And liquid from Run 3 was erroneously poured into a beaker from Run 2.

From the reference supplied in petitioner's brief, we discern that this criticism of testing procedure was based upon data released on the testing after the 45 day period of comment had passed, and so there was no opportunity at that time to bring this sampling error to the attention of the agency. However, our October 1972 remand gave EPA an opportunity, in its updating and ongoing reexamination, to make a specific comment on petitioner's objection to the Dragon plant test. Instead, only the comment of Mr. Striker was presented.

Ordinarily, we would not consider comments not presented to EPA. But here there was belated disclosure by EPA of back-up testing, and remand will be necessary concerning the Striker criticism. Accordingly, we will provide that EPA should, on remand, consider the contentions presented in briefs to this court, though not previously raised, unless EPA explains why they are not material. It will be for EPA, on the remand, to examine the relevancy and import of petitioners' criticisms of the Administrator's methodology.

3. Analysis of Support for Standards

A troublesome aspect of this case is the identification of what, in fact, formed the basis for the standards promulgated by EPA—a question that must be probed prior

[68] Portland Cement Association Brief at 17-18.

to consideration of whether the basis or bases for the standards is reliable. Nominally, there would seem to be three major bases for the rule and its standards: (1) the tests run on the dry-process Dragon Cement Plant, (2) the tests run on the wet-process Oregon Cement Plant, and (3) literature sources. The two tests were discussed by EPA in the supplemental statement issued subsequent to the issuance of the rule. As to literature sources, the Background Document issued with the proposed rule identifies as "a principal literature source" a government study, undertaken under the auspices of HEW in 1967, entitled "Atmospheric Emissions from the Manufacture of Portland Cement".

In the briefs to this Court, EPA counsel disclaim reliance on these three sources, despite statements directly to the contrary accompanying the proposed and promulgated rule, and the supplementary statement of reasons issued on the basis of *Kennecott*.

In regard to the tests, the EPA brief states:[69]

> Since the tests conducted by EPA were used, *along with other items,* to assist in determining what emission levels were being achieved by properly maintained and operated control equipment, and were not used as the *primary* basis for the cement standards, petitioner's criticisms of such tests and testing procedures are irrelevant. (emphasis supplied)

The brief further states that the HEW study "was not relied upon to support the achievability of the cement standards".[70]

Counsel on appeal cannot substitute new reasons for those offered by the agency.[71] Certainly, counsel cannot disclaim

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[69] Brief at 21-22.

[70] *Id.* at 19.

[71] Burlington Truck Lines v. United States, 371 U.S. 156,

reliance on reasons offered by the agency in its statement of reasons, except in the sense that errors may be asserted to fall within the limited "harmless error" doctrine applicable to administrative agencies.

We turn now to the specific technical problems raised by the cement manufacturers.

a. *Dragon Cement Plant tests* [72]

Two kilns were tested by the EPA contractor at the Dragon Cement Plant.[73] A test of a dry-process kiln controlled with a baghouse is used for support of the standard since testing "showed particulate emissions of 0.20 pound per ton of feed, which is below the proposed standard."[74] This particular plant was selected for testing on the basis that it was reportedly one of the 12 best controlled plants in the United States.

168-9 (1962); International Harvester, *supra*, slip op. at 25; Braniff Airways, Inc. v. CAB, 126 U.S.App.D.C. 399, 411, 379 F.2d 453, 465 (1967).

[72] A description and analysis of these tests is in the Certified Record, Tab V(i). Emission Testing Report, ETB Test Number 71-MM-05. Emissions from Dry Process Cement Kiln at Dragon Cement Company, Northampton, Pennsylvania. Environmental Protection Agency, Office of Air Programs.

[73] The Background Document indicates that two wet process kilns controlled by electrostatic precipitators were unable to meet the proposed standards, and they are not relied upon here. We are not supplied with an identification of the plant(s) where these tests were performed. The Background Document states that four kilns were tested but that "results of only three tests were available at the time the standards were proposed" and also discloses that the missing test was performed upon a dry process kiln. JA at 47-48. We are uncertain whether this fourth kiln was one of the two tested at the Dragon Plant or was located at still another plant.

[74] *Id.* at 48.

The first point raised by petitioner, and included in the comments by cement manufacturers presented to the agency on its proposed standard,[75] was that a single test offered a weak basis for inferring that all new cement plants would be able to meet the proposed standards. As we stated in *International Harvester, supra,* slip opin. at 55, "It would . . . seem incumbent upon the Administrator to estimate the possible degree of error inherent in his prediction." The significance of the lack of any indication of statistical reliability was underscored by T. E. Kreichelt, the author of the HEW study relied upon by the Administrator, in a letter, by way of comment, on the proposed standard.[76] He stated that "the emission limit was based on one (1) test, i.e. the fabric filter test. . . . I do not believe that the emission limits should be selected on only four tests, much less one test."

Mr. Kreichelt raised a second and related point addressed to the reliability of a prediction based on a successful dry-process plant, for a prediction that wet-process plants would be able to also meet the standard. He stated in this regard:[77]

> Another outcome of basing emission limits on insufficient data is that the limit may represent only part of a given industrial classification. For example, is 0.30 lb/ton of feed attainable only for dry-process kilns? Or is it also attainable for wet-process kilns? Probably both, but there is not even one test to substantiate the limit for wet-process kilns. For each variation of each process of each source classification, the number of tests required should be sufficient (say, three tests within the limit) to result in statistically sound limits.

[75] *See* Comments in C.R. Tab VIII, items 10 (Portland Cement Association), 14 (General Portland Cement Company), 20 (Ideal Basic Industries, Inc.).

[76] Letter of Thomas E. Kreichelt, C.R. Tab VIII, item 27, at 2.

[77] *Id.*

We are not here considering a regulation that was issued in the contemplation that all new cement plants will be dry-process, and controlled by baghouses on the theory that this is the "best system" of emission control. Possibly such an approach would be feasible, but in any event it would require underlying reasons, by EPA, to terminate the process which the HEW had identified as major now and in future projection.[78]

A second objection is to the techniques used by the EPA to measure emissions from the Dragon plant.

These "sampling" techniques assume particular importance if they deviate from procedures, outlined by regulation, for ascertaining compliance with prescribed standards. Although this difference could be eliminated—as the Administrator attempted to do in *International Harvester* —by rewriting "sampling" techniques, rather than lowering standards, a significant difference between techniques used by the agency in arriving at standards, and requirements presently prescribed for determining compliance with standards, raises serious questions about the validity of the standard.[79]

[78] *See* ATMOSPHERIC EMISSIONS, *supra* note 51, at 6-7.

[79] "Sampling" techniques were modified by EPA between the date of the proposed rule and the promulgated rule in this case. The EPA stated in adopting the rule here under review, 36 Fed. Reg. 24876 (1971), at ¶ 1:

> Particulate matter performance testing procedures have been revised to eliminate the requirement for impinges in the sampling train. Compliance will be based only on material collected in the dry filter and the probe preceding the filter.

We speak here of inconsistencies between the revised standards and the tests performed on which the standards were based.

The cement manufacturers point, in this regard, to the absence of continuous sampling in the EPA data, since the "longest elapsed time of any sampling episode was 30 minutes",[80] whereas under the regulations promulgated, conformity is to be measured on the basis of maximum 2-hour averages.[81] It is incumbent on the Administrator to explain the discrepancy.

The second point raises the question, on the basis of a handwritten note made by the EPA contractor, as to whether the tested plant was operating at maximum performance during testing. The contractor had noted, "Baghouse is undersize and production is held back due to this."[82] Compliance tests under the regulation require, however, that "All performance tests shall be conducted while the affected facility is operating at or above the maximum production rate. . . ."[83]

Thirdly, petitioner contends that mistakes made in the measurement process prevented the test from using observed, measured values. As previously noted, encrusted solids can collect in the bag, and must be constantly cleaned out if the baghouses are to operate with efficiency. In one of the runs conducted, the presence of solids in a duct leading to the stack were thought to cause a high reading, so lower readings from other test runs were submitted. On another run, the liquid, which was to be the basis for a

[80] This claim is made on the basis of inspection of the full report of the EPA contractor. *See* C.R. Tab V(i), App. E, at 41.

[81] § 60.62 (a) (1), 36 Fed. Reg. 24876 (1971).

[82] C.R. Tab V(i), App. B, at 22. This notation was made on a form which required, in part, a "description of any unusual features about environment; height; odors; toxic conditions, temperature, dust, etc.

[83] § 60.64 (b), 36 Fed. Reg. 24876 (1971).

measurement of particulate concentration, was erroneously poured into a beaker from a previous run.[84] However, deviations from prescribed measurement techniques are not necessarily significant as to testing results, and if petitioners press this point on remand they must establish that such test deviations bear significant consequences.

Finally, engineer Striker claims significant errors of measurement were made in determining the measurement of the cubic feet of stack gas per minute, and a resulting understatement of the true volume of calcining carbon dioxide included in total stack gas. He states that commonly "35% (plus or minus 1%) of raw feed is converted into carbon dioxide in the burning process."[85] He then notes that an accurate measure of raw feed is the volume of calcining carbon dioxide[86] appearing in stack gas, which in turn depends on an accurate measurement of the volume of stack gas. His own calculations, based on EPA data showing a stack flow rate of 51,187 cubic feet per minute of dry gas, indicate that there were 2153 cubic feet per hour of stack gas in the test attributable to calcining carbon dioxide coming from the raw feed and that "as a matter of basic chemistry" 2153 cubic feet of calcining carbon dioxide "comes only from 22.11 tons of raw feed."[87] This was at variance from the kiln rate of 44.03 tons of raw feed per hour reported in the test. He concludes that the error lay not in the measurement of the raw feed, but in the test data reported on the stack gas volume—flow rate of 51,187—which in his judgment requires more sophisticated equipment for recording than does the raw feed which is

[84] C.R. Tab V(i), at 7.

[85] C.R. Tab IX, at 3.

[86] The term calcining carbon dioxide is used to distinguish it from the carbon dioxide that is the result of burning fuel in the kiln.

[87] C.R. Tab IX, at 4.

easily measureable. Having corrected the stack gas figure, he states his opinion that the EPA assumption of emissions satisfying its ultimate 0.30 standard was in error.[88] He concluded:

> It is my personal opinion that the particulate matter emissions of .202 pounds in test 1 per ton of kiln feed reported . . . is grossly erroneous and that the correct emission of particulate matter is in the neighborhood of .404 pounds per ton of kiln feed.

We are not competent to decide if Mr. Striker's methodology and conclusions are correct. We can note, however, that he claims that as a matter of "basic chemistry" two test values, for feed and gas volume, cannot co-exist. This is certainly the type of criticism EPA should be required to discuss on remand.

2. *Oregon Portland Cement Plant tests*[89]

The Oregon plant was wet-process controlled by a baghouse. Three tests were made on the kiln operation. The brief of petitioner Portland refers to the test results of the EPA contractor, and points out that these show that in test 1 and 2, particulate emissions were .535 and .361 pounds per ton of kiln feed. Only in the third test was there a result of .291 pounds. Petitioners argue that when only one out of the three tests meet the EPA standards (0.3 percent), the data undercut the validity of the standard. EPA's brief did not address itself to this point, relying instead on its general expertise. If our study of the matter is accurate, it appears that petitioners failed to take into account that the standard, as promulgated, eliminated

[88] *Id.* at 2.

[89] A description and analysis of these tests is in the Certified Record, Tab V(h), Emission Testing Report, ETB Test Number 71-MM-15. Emissions from Wet Process Kiln at Oregon Portland Cement, Lake Oswego, Oregon. Environmental Protection Agency, Office of Air Programs.

one of the sampling techniques required by the standard as proposed. This undercuts petitioner's contention.[90]

A more serious matter is presented by intervenor Northwestern, which points to the fact that the EPA contractor's report indicates that sampling was not conducted when "process operation was interrupted" and that sampling was only conducted during the periods of "normal operation". The report states:

> Several conditions contributing to these interruptions were: (1) excessive pressure drop across bag house, (2) visible emissions from leaking bags, and (3) breakdown of dust removal equipment. (C.R. Tab V (h) at 9).

The concern of the manufacturers is that "start-up" and "upset" conditions, due to plant or emission device malfunction, is an inescapable aspect of industrial life, and that allowance must be made for such factors in the standards that are promulgated. On August 18, 1972, some eight months after the issuance of the standards under review, and prior to our October, 1972 remand, the EPA proposed a new regulation to take "startup, shutdown and malfunction" problems into effect.[91] The proposed regulation,

[90] C.R. Tab V(h) at 5. Curiously EPA did not make the point that the test results of .535, .361, .291, showing only 1 out of 3 successful tests, were based on "total catch". This means that the results reflected readings based on probe, filter and impinger sampling techniques. As we observed however, note 79 *supra*, the adopted standard was based only on probe and filter sampling techniques. The Oregon test gave these results for tests conducted on that basis: .247, .309, .261, which shows two successful tests and one almost successful. C.R. Tab V(h), at 4-5.

[91] 37 Fed. Reg. 17214 (August 18, 1972). EPA admitted in its introduction to the proposed regulation that the standards here under review did not take into account this problem. EPA attempted to obviate the implicit criticism by stating in

which as yet has not been adopted, sets up a procedure by which emissions due to malfunction will not be the basis of an enforcement action. It requires reports from manufacturers in cases where emissions exceed standards, recording the "violation" and indicating what measures will be taken to correct or minimize the excess emission levels. The proposed regulation provides:[92]

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its proposal:

> Such occurrences generally are dealt with by the exercise of discretion in the Agency's enforcement activities. The exercise of this discretion would have been accomplished by means of an informal process, in which, before the Agency took enforcement action, sources that had exceeded the standards would have attempted to demonstrate to the Agency that such excess emissions had been unavoidable.

Broadly read, however, this view of enforcement discretion would defer the question of "available" technology to the enforcement stage, an approach not contemplated by section 111. Companies must be on notice as to what will constitute a violation. Moreover, an excessively broad theory of enforcement discretion might endanger securing compliance with promulgated standards.

We do agree, however, with the policy reasons offered by EPA for moving from an informal to a formal system of regulation. EPA's explanation of its regulation stated:

> Three fundamental reasons suggested the correctness of this determination. First, the existence of a formal process better informs the public of the policy and factual issues which will underlie enforcement of the standards. Second, affected industries which are making good faith efforts to meet the standards will on the whole welcome a regularized means of informing the Agency in detail of the circumstances surrounding unavoidable emissions. Third, the Agency expects to benefit substantially from the information it will gain about the operation of the processes in question, for both future enforcement and standard setting.

[92] *Id.*

> (f) Nothing in this section shall relieve a source from compliance with the standards set forth in this part unless the Administrator determines that (1) the occurrence in question did not result from the failure by the owner or operator of the source to operate and maintain properly the affected facility, (2) all reasonable steps were taken to correct, as expeditiously as practicable, the condition causing the emissions to exceed the standards, including the use of off-shift labor and overtime if necessary, and (3) all reasonable steps were taken to minimize the emissions resulting from the occurrence.

The proposed regulation, if adopted, may have consequences which go beyond mere provision for malfunctions. In some sense it imparts a construction of "reasonableness" to the standards as a whole and adopts a more flexible system of regulation than can be had by a system devoid of "give." As we noted in *International Harvester, supra,* a regulatory system which allows flexibility, and a lessening of firm proscriptions in a proper case, can lend strength to the system as a whole. "The limited safety valve permits a more rigorous adherence to an effective regulation." Slip opin. at 44, quoting from WAIT Radio v. FCC, 135 U.S. App.D.C. 317, 323, 418 F.2d 1153, 1159.

If the EPA adopts, or intends to adopt, this proposed regulation, it may take the attendant flexibility into account, on remand, as pertinent to the manufacturers' objections, even though the new regulation has been proposed in a proceeding with a different docket number and caption.

3. *Literature Sources*

The principal source in the scientific literature used by EPA, HEW's "Atmospheric Emissions from the Manufacture of Portland Cement",[93] is called into question by pe-

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[93] *See* note 51 *supra.*

titioner on the ground that the test methods used to compile the results of the study were at odds with those used by EPA in its own tests.[94] While counsel for EPA disclaims reliance on the source, the study was cited in the EPA's Statement of Reasons, and EPA should address itself to this contention on remand.

In this connection, a comment on the proper use of scientific literature may be in order. If such literature is relied upon, the agency should indicate which particular findings of that literature are significant. A generalized reference, to a work as a whole, will avail the agency little if a problem arises on judicial review. On remand, any findings in the literature that are relied on by EPA should be specifically indicated. The same procedure is contemplated here as for the test data not submitted to the manufacturers prior to promulgation of the rule, that there be opportunity for comment, and an explanation presenting the EPA position on any challenge.[95]

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[94] As to how results might be skewed by different sampling methods, *see* note 90 *supra*, and Comments of Mr. Kreichelt on the proposed rule, C.R. Tab VIII, item 27, at 2-5.

[95] There is evidence in the record furnished by vendors of emission control devices but not relied upon by the EPA to support its standard that, with proper allowance for malfunction problems, the standards can be met. By way of comment to the proposed rule, Mr. R. E. Frey, Vice President, Mikro Pul Co., stated in a letter of September 20, 1971, C.R. Tab V(e), that: "A properly applied fabric filter (or bag house) will operate with no visible emission. Actual measured outlet loadings are almost always below 0.02 grains per cubic foot and often as low as 0.000 x grains per cubic foot." This would of course be below the required .03 grains per cubic foot standard, the converted measure of .30 lb. per ton of feed to the kiln.

Three letters were inserted into the record following our June 1972 remand of this case, following the motion of intervenor Medusa Corp. Mr. Jack C. Thomas, Sales Manager of Rock Products Industry represented to Medusa that:

> "We can and will guarantee that our Lurgi Electrostatic Precipitator will limit the effluent to less than .30 lbs. per ton of feed to the kiln. However, we cannot guarantee to meet this collection efficiency 100 per cent of the time. During kiln start-up and upset conditions and during possible malfunction, it is conceivable that the effluent would not be in compliance with the E.P.A. Code.

Similar guarantees were offered by Rock Creek for fabric filter bags.

Claims of capability to conform to the EPA standards were also in letters to Medusa—though without mention of guarantees—from Buell, Division of Envirotech Corp., and Kaiser Engineering. C.R. Tab X.

These claims by the vendors could not be responded to by way of comment, since they were themselves produced as comment, and can be considered on remand. We note, however, that if vendor representations were to be a principal source of reliance by the agency, representations peculiarly subject to considerations of self-interest, more might be required than mere comments. *See* American Airlines v. CAB, 123 U.S.App.D.C. 310, 318-319, 359 F.2d 624, 632-33 (1966) (en banc), *cert. denied*, 385 U.S. 843 (1966). *Compare* International Harvester, *supra*, slip op. at 22. *Also see* Kennecott Copper *supra*, 149 U.S.App.D.C. at 235, 462 F.2d at 850: "There are contexts however, contexts of fact, statutory framework and nature of action, in which the minimum requirements of the Administrative Act may not be sufficient."

[96] § 60.62(a)(2), 36 Fed. Reg. 24876 (1971).

4. *Opacity Standard*

Apart from the standard directly regulating particulate concentration, EPA has adopted an opacity standard which provides that there shall be no discharge of particulate matter from the kiln which is:[96]

> Greater than 10 percent opacity, except that where the presence of uncombined water is the only reason for failure to meet the requirements for this subpara-

graph, such failure shall not be a violation of this section.

Opacity is defined by the regulation as "the degree to which emissions reduce the transmission of light and obscure the view of an object in the background." [97]

It may be, as EPA argues, that the opacity test is an important enforcement tool,[98] and that the results of an opacity test, which is normally performed at some distance from the plant by trained observers, offers a cheaper and faster method of determining compliance than enforcement of the particulate concentration standard.[99] However, it is one thing to use a method of testing to observe possible violations of a standard; it is another to constitute that method as the standard itself. If the opacity test is to be a standard, and if violations can result in enforcement actions without further testing, the standard must be consistent with the statute and congressional intent.

The thrust of the manufacturers' comments to EPA, and repeated here, is that the opacity test is arbitrary—that inspectors will be unable within any reasonable degree of accuracy to determine whether permitted opacity is 10%.

The critical question is how accurate can opacity observations be. On this point we essentially have before us only

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[97] *Id.* at § 60.2(j).

[98] *See* Comment of State of Maryland to the proposed rule: "Such a prohibition is one of the most effective tools available to state and local regulatory authorities." C.R. Tab VIII, item 24.

[99] Although the revised sampling methods of EPA may have lowered the cost of testing for compliance, National Gypsum Co. commented to the agency on the proposed rule that "the cost of running a test by the proposed method on a single baghouse ranges in the neighborhood of $10,000 to $15,000. . . ." Tab VIII, item 6.

the contentions of the parties. The manufacturers do point to a test conducted for the National Center for Air Pollution Control (U.S. Dept. H.E.W.), where six trained smoke inspectors evaluated a white training plume known to have 0% opacity.[100] All six inspectors rated the plume at more than 0% opacity and 3 evaluated it at more than 20%. A plume known to be at 20% opacity was rated higher than 20% by 5 of the 6 inspectors (one rated it lower) and 2 of them rated it at almost 40%. Problems may also be posed for deciding when opacity is due to water content and when it is not.[101]

The difficulty is that this test has the thrust of indicating that opacity measurements are inherently inadequate, and does not seem to be probative of the manufacturer's quite different claim, namely, that it is at the low ranges that opacity tests become less reliable, and too unreliable to be a legal standard.

On the other hand, EPA's brief does nothing more than point to the fact that many states have required that the plumes from stack emissions conform to a specified percentage of opacity. We note, however, that the opacity standard is at least 20% in the states cited, which corresponds to No. 1 on the Ringelman Smoke Chart.[102]

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[100] *See* Optical Properties and Visual Effects of Smoke Stack Plumes, Pub. Health Serv. Pub. 999-AP-30 (1967 National Tech. Info. Serv. PB 174-705), at 28.

[101] *Compare* State v. Fry Roofing Co., 495 P.2d 751, 757-58 (Ore. Ct. App. 1972).

[102] *See* Arizona Rules and Regulations for Air Pollution, 1 BNA State Air Laws Environ. Reptr. (BNA Air) 311:0502 (40% for visible emission); Arkansas Air Pollution Control Code, 1 BNA Air 316:0504 (20% for new equipment used in a manufacturing process); California Health and Safety Code § 24242 (1967) (40% for aircraft discharge). *Also see* Con-

We think the HEW test adduced by petitioners, though not decisive, suffices to require further consideration and explanation by EPA on remand, and a showing on the record that 10% opacity measurements can be made within reasonable accuracy.[103]

V. The Standard of Judicial Review and Conclusions

We are quite aware that the standards promulgated and here under review are to be applied to *new* stationary sources. It would have been entirely appropriate if the Administrator had justified the standards, not on the basis of tests on existing sources or old test data in the literature, but on extrapolations from this data, on a reasoned basis responsive to comments, and on testimony from experts and vendors made part of the record. This course was not followed here. Instead, the Administrator in his statement of reasons relied on tests on existing plants and the literature, which EPA counsel now discounts without reference to other record support to take its place.

The Administrator's objectives are laudable, but the statute expressly requires, for the standards he promulgates, that technology be achievable. This record reveals a lack of an adequate opportunity of the manufacturers to comment on the proposed standards, due to the absence of disclosure of the detailed findings and procedures of the tests. This was not cured following our previous October 1972 remand to the agency.

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necticut Administrative Regs., 1 BNA Air 331.0513 (20% for visible emissions); Delaware Administrative Regs., 1 BNA Air 336.0861 (20% for visible emissions).

[103] We think Congress anticipated, as in the National Traffic and Motor Vehicle Safety Act of 1966, that the standards be "objective", 15 U.S.C. § 1392(a), Otherwise "a manufacturer has no assurance that his own test results will be duplicated in tests conducted by the Agency." Chrysler Corp. v. Dept. of Transportation, 472 F.2d 659, 675 (6th Cir. 1972).

We have identified a number of matters that require consideration and clarification on remand. While we remain diffident in approaching problems of this technical complexity, *see International Harvester, supra,* Slip. opin. at 56, the necessity to review agency decisions, if it is to be more than a meaningless exercise, requires enough steeping in technical matters to determine whether the agency "has exercised a reasoned discretion". Greater Boston TV v. FCC (I), 143 U.S. App.D.C. 383, 392, 444 F.2d 841, 850, *cert. denied,* 403 U.S. 923 (1971). We cannot substitute our judgment for that of the agency, but it is our duty to consider whether "the decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment." Citizens To Preserve Overton Park v. Volpe, 401 U.S. 402, 416 (1971). Ultimately, we believe, that the cause of a clean environment is best served by reasoned decision-making. The record is remanded for further proceedings not inconsistent with this opinion.

So ordered

EXCERPTS FROM EPA RESPONSE TO REMAND

ORDERED BY U.S. COURT OF APPEALS

FOR THE DISTRICT OF COLUMBIA

IN PORTLAND CEMENT ASSOCIATION v. RUCKELSHAUS
(486 F. 2d 375, June 29, 1973)

EPA 450/2-74-023
November 1974

Cost-Benefit Analysis

PCA argues that EPA should do a cost benefit analysis. Such an analysis has not been made because reasonable means for doing so do not yet exist, in the opinion of EPA. An emission limitation on a specific type of emission source will have different effects on ambient levels in different places. Ambient levels are affected not only by emission

levels of specific sources but also the placement of such sources relative to other sources and to meteorological conditions around each of such sources. Furthermore, sources vary in their geographical relationships to populations, wildlife, vegetation and other factors which would be impacted by the emission source. Thus relating the cost of control to the benefits of the control at least at this time is a practical impossibility.

We believe that Congress intended §111 to be used to establish emission limitations which are the lowest that can be achieved by that industry. Where the cost of meeting such standards would be so great that the industry could not bear the costs and survive, such standards could not be implemented by the industry regardless of technological feasibility. There are also cases where a reduction in emissions that would be achieved by a particular control technique would be so grossly disproportionate to the cost of the control technique that it would not be required. However, these determinations are necessarily judgmental and are left specifically to the Administrator in §111. EPA does not believe that cost benefit analysis can be established for standards under §111 nor does it believe that Congress intended that standards be established or justified on the basis of such an analysis.

Although EPA has not conducted a cost benefit analysis for these standards, we have considered PCA's criticisms of the standards based on cost benefit analysis. PCA relies heavily on a conceptual chart published in an HEW publication: Control Techniques for Particulate Air Pollutants, Pub. No. AP-51. This chart shows a smooth curve relating "Capital Costs" (although no units are shown on the chart) to efficiency of the control techniques. The chart shows the curve rising asymptotically as efficiency approaches 100 percent. However, this chart does not represent

the realities of control of particulate emissions in the Portland cement industry. The primary method of control relied on by EPA at the time the standards were developed was control by baghouses. Baghouses when properly designed, installed, and maintained operate at nearly the same collection efficiency, thus the relationship between cost and efficiency is somewhat inelastic. It is well established that properly designed and maintained baghouses can limit emissions to .03 grains per actual cubic foot (ACF) of emission air and gases. EPA tests confirmed that baghouses already installed on Portland cement plants were capable of achieving .03 gr/acf if properly maintained and operated. In fact, EPA believes and recent tests confirm that baghouses can achieve higher removal efficiencies. However, at some point of control where emission levels are less than .03 gr/acf the removal efficiencies will not increase to any great extent regardless of the cost of the equipment. It is only coincidential that the standard for Portland cement plants results in costs that fall below the level where costs rise sharply compared to increased removal efficiency. This type of cost-effectiveness analysis was neither the basis for setting the Portland cement standard nor any other new source performance standard. In general, a standard will not be established at a level at which the cost of compliance would result in the inability of new plants to compete with established firms in the industry. This type of analysis is not based upon cost effectiveness but rather upon the economic structure of the industry as a whole.

PCA commented that if cost benefit comparisons were made between the standards for Portland cement plants on the one hand and coal-fired power plants and incinerators on the other, they would indicate that the Portland cement standards should be loosened and the others should be tightened to achieve a cost benefit equality. The particulate standards for coal-fired power plants and incinerators were based on the use of precipitators. Although

there were indications at the time the standards were promulgated that precipitators could be used on Portland cement plants and baghouses could be used on coal-fired power plants and incinerators, EPA based its standards on the methods which had been established as applicable to the source subject to the standard. Furthermore, EPA based its particulate standards for power plants and incinerators on emission levels being achieved at existing plants. Because the removal efficiencies being achieved by properly maintained and operated baghouses on Portland cement plants were superior to those being achieved by power plants and incinerators, the effective emission concentration limits were more restrictive for Portland cement plants.

It now appears that precipitator technology may achieve the same levels of control, i.e., below .03 gr/acf, required of the Portland cement industry and that baghouses can be applied to the other two industries. EPA will consider whether the particulate standards for the other two industries should be tightened. However, EPA does not believe that inequalities between the effective emission concentration limits between these three types of sources should be eliminated by loosening the standards applicable to Portland cement plants as urged by PCA to permit such plants to emit an additional "10,000 tons per year" (PCA's figure) of particulate matter to the atmosphere.

PORTLAND CEMENT REMAND RESPONSE: APPENDIX III, PART A: OPACITY STANDARD

In the case of other points at issue in this Remand Response, it has been necessary only to supplement the November, 1973 Draft Response to deal with the comments of the Portland Cement Association and others on that Draft Response. In order to respond fully to the comments with respect to opacity, it has been necessary to prepare the rewritten, extensive response found in this Appendix III. The response contained herein should therefore be considered to supercede that portion of the Draft Response dealing with the opacity standards, and the present Appendix III constitutes the Administrator's full and complete position with regard to this issue.

EPA promulgated opacity limits as well as mass emission limits primarily because EPA believes that opacity limits provide the only effective and practical method for determining whether emission control equipment, necessary for a source to meet the mass emission limits, is continuously maintained and operated properly. It has not been EPA's position that a single, constantly invariant and precise correlation between opacity and mass emissions must be identified for each source under all conditions of operation. Such a correlation is unnecessary to the opacity standard, since the Administrator consistently develops opacity standards for each class of sources at a level no more restrictive than the corresponding mass emission limitation with due consideration given to all conditions

of operation.[1,2,3] Any source which is meeting the mass limit will therefore also be meeting the opacity limit; if a source is not meeting the opacity limit, this will be due to the failure of that source to properly maintain and operate its emission control equipment. And if the equipment necessary to meet the mass emission standard is not properly maintained and operated, the source will also fail to meet the mass emission standard.

Opacity standards are a necessary supplement to mass emission standards, since there is no reliable instrument to directly measure mass emissions currently available. If only mass emission standards were in effect, operators would not be compelled to assure proper maintenance and operation of pollution control equipment at times other than during periods of performance testing. Two weeks or longer are necessary to schedule a typical stack test, due to the preparation involved. If relatively minor repairs were all that were needed in a given case, such as pump or fan repair or replacement of fabric filter bags, a plant operator could delay such repairs and continue to pollute until shortly before the stack test was conducted. For some types of control equipment, such as scrubbers, the operator could reduce the input of energy (the pressure drop through the system) thereby partially or totally defeating the air pollution control system when stack tests were not being conducted and through such action could release significantly more particulate matter than permissible under the mass emission standards.

Furthermore, stack tests can only be conducted with limited frequency, since they often cost up to $10,000 to perform. Therefore, EPA has required that operators properly maintain and operate air pollution control equipment at all times [40 CFR 60.11(d)] and meet opacity standards at all times except during periods of startup, shutdown, malfunction, and as otherwise provided in the applicable standard [40 CFR 60.11(d)]. Opacity is established as an independent, enforceable standard, rather than merely as an indicator of maintenance and operating conditions, because information regarding those conditions is peculiarly within the control of the operator. The time and expense required to prove that proper procedures have not been followed are so great that the provisions of 40 CFR 60.11(d) by themselves (without opacity standards) would not provide a practical means for ensuring that on a day-to-day basis the pollution control equipment is maintained and operated in the way necessary to meet the mass emission limitations. Opacity standards, in contrast, require only a qualified observer and can be performed with no prior notice. In some cases, of course, a full investigation of operating and maintenance conditions will be desirable. Accordingly, the opacity standards and maintenance requirements were both promulgated, and work in tandem to guarantee that proper maintenance and operation of pollution control equipment, the sine qua non of continuous compliance with emission limits, can in fact be required and monitored.

Two primary aspects of the opacity standards, raised by Petitioner Portland Cement Association, were identified by the Court of Appeals as

the bases of its concern: 1) the inherent reliability of opacity standards, i.e. whether measurements of opacity can be made with reasonable accuracy, and 2) the achievability of the opacity standard set for portland cement plants.

RELIABILITY OF OPACITY STANDARDS

Accuracy of Opacity Measurements in Detecting Violations

The Portland Cement Association (PCA) contends that opacity measurements cannot be made with reasonable accuracy. PCA indicates, in particular, that individual observer readings under certain conditions are often in error by 10 percent opacity or more, and therefore that "equivalent opacity--at any level--is an inherently inadequate and invalid measure to determine compliance with, or violation of an anti-pollution law." In support of this contention, PCA argues that observed opacity may be affected by such factors as: dark nights, contaminated water vapor or detached plumes, lack of contrasting background (e.g., white plume viewed against an overcast sky), and wind velocity.

The PCA and other commentators contend also that EPA smoke school requirements and procedures are inadequate to ensure that qualified observers will make accurate readings. The procedure whereby training plumes are shown in advance of certification runs, and under which observers are allowed to use fixed (non-sky) contrasting backgrounds are noted as specific deficiencies.

In response to the questions raised by the Court and the PCA, EPA has reviewed available data concerning the accuracy of qualified

observers;[4,5,6] has reviewed the theory of equivalent opacity, particularly concerning the effect of variable viewing conditions on accuracy;[5,6] has reviewed the smoke school certification procedures; and has conducted extensive field tests involving both specially generated plumes and industrial plumes.[7] On the basis of this extensive review, EPA concludes that the accuracy of Reference Method 9 has been well established, that its error tolerance is reasonable and is within limits considered normal by the scientific and engineering community, and that when that error tolerance is accounted for in assessing the results of opacity readings, the method is valid and reliable for determining compliance with prescribed opacity standards. EPA also concludes that the smoke school certification procedures are adequate to assure proper qualification and accuracy of qualified observers. The basis for these conclusions is set forth below.

PCA contends that plumes of the same actual opacity will appear to have somewhat different opacities under dissimilar conditions of viewing. EPA agrees that this is true. A plume will appear most visible to an observer when the plume is viewed against a contrasting background.[5,6] A white plume therefore will be more visible when viewed against a black background or a blue sky than it will when viewed against a hazy or overcast sky.[5] Indeed, a white plume viewed against a white background may well be invisible. PCA concludes that because a plume will appear of lesser opacity under less contrasting conditions, EPA's opacity standards, which limit allowable opacity

even under conditions of maximum apparent opacity, are inaccurate and unreliable. It is with this illogical conclusion that EPA disagrees. Cement plant operators are in no way prejudiced by the fact that under less contrasting conditions the opacity of their plume may be read at less than its actual value; obviously, this is to their advantage. Their only real concern, therefore, is with the accuracy of opacity readings under viewing conditions of highest apparent opacity.

Since opacity appears greatest under conditions of high background contrast, it is under such conditions that the potential for positive observer error (observed opacity greater than true opacity) is greatest. This is verified by the available data, which show that positive observer error (average of 25 readings) can approach + 7.5 percent under relatively high contrast conditions such as are encountered at a smoke school, when a training plume is observed against a contrasting background.[4,7] Against a less contrasting background, a plume will be less visible and observer errors will tend to be negative (observed opacity less than true opacity). A collaborative test performed at a power plant where a white plume was observed on an overcast day confirmed that this downward bias can be significant, to the extent that the probability of positive errors even in single readings is essentially non-existent under such conditions.[4]

It is clear therefore that in assessing the reliability of the opacity standards, the possibility of positive errors is of primary concern, since such errors could in theory result in the determination

of a violation when true opacity was below the standard. While negative errors are undesirable from an enforcement point of view, they do not place a complying source in jeopardy. It is only necessary therefore to quantify the positive error, which may occur under high contrast viewing conditions, to demonstrate that the method does measure opacity with the reasonable accuracy required of an enforceable standard. As the Court of Appeals notes in Amoco Oil Company v. E.P.A., 501 F2d 722, (6ERC 1481, May 1, 1974, slip op. at pp. 38-39):

> Petitioners also contend that any test methods adopted will involve a certain capacity for statistical error. We fail to appreciate the force of this argument. The possibility of statistical measurement error, which is often unavoidable where regulations set quantitative standards, does not detract from an agency's power to set such standards. It merely deprives the agency of the power to find a violation of the standards, in enforcement proceedings, where the measured departure from them is within the boundaries of probable measurement error. (Emphasis in original.)

The following data provide a basis for such quantification and lead to the conclusion that, using an average of 25 readings obtained under the conditions prescribed in Method 9, qualified observers are able to consistently assign opacity values under relatively ideal conditions, with a positive error seldom exceeding 7.5 percent opacity.[8,9]

(a) October 1973 report titled "Average Observation Error Associated with Smoke Plumes at Levels of Known Opacity".[4] This report in addition to showing that each observer met the ± 7.5 percent requirement, shows that when the readings of all observers are averaged, the largest positive error associated with a given opacity level was 5.0

percent opacity which occurred when the true opacity was 10 percent. For plumes between 15 percent and 90 percent opacity, the average error did not exceed + 2.8 percent opacity. This is a clear demonstration of the inherent accuracy of the technique of determining plume opacity through observation by qualified observers.

(b) In a test conducted November 19-20, 1973, nine qualified observers were shown plumes generated by a smoke generator.[7] The plumes were presented in runs of 25 each during which each observer assigned opacity using the procedures set forth in Method 9. A total of 133 sets of 25 observations using black smoke and 170 sets of 25 observations using white smoke were made. The results of this test are as follows. For white plumes, 99 percent (168 of 170) of the sets of observations were made with an error of less than + 7.5 percent opacity. Ninety-five percent of the sets of observations were made with an error of less than + 5.8 percent opacity. For black plumes, the accuracy was even better: 99 percent of the sets of observations were made with an error of less than + 5 percent opacity; 95 percent were made with an error of less than + 2.7 percent opacity.

(c) A test was conducted at a power plant in Charlotte, North Carolina, on September 30, and October 1, 1974.[7] In this test, 8 qualified observers made a total of 168 sets of 25 observations and

assigned opacity according to the procedures of Method 9.* Each run consisted of 25 individual readings. All observers had been certified according to Method 9. Two of the 8 observers had not had previous field experience and two had only limited field experience. The power plant plume (which was monitored with an in-stack transmissometer) was white in appearance and was viewed against a constrasting clear blue sky (no condensed water vapor was present in the plume). The plume was held relatively constant during some runs and was varied during other runs in order to simulate the various conditions which could be encountered in the field. The test results showed that 99 percent (166 of 168) of the observations (average of 25 readings) were made with an error of less than + 6.2 percent opacity; 95 percent with an error of less than + 4.7 percent opacity, and 90 percent with an error of less than + 2.6 percent opacity.

(d) A test was conducted at a sulfuric acid plant on January 29-30, 1974.[7] The plant was equipped with an in-stack transmissometer.**

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* This test was conducted with the 8 observers divided into two groups of 4 each. One group, the control group, made all readings from an optimum viewing location. The second group made readings under differing conditions. Only the readings which were made according to Method 9 criteria are reported here, except that 32 sets of readings are also included which did not conform precisely to Method 9. In these sets, observers were located at an optimum location and assigned opacity in 1 percent increments, not 5 percent increments as specified in the method. The only other data collected but not included in the totals shown here, was read with the sun outside the 140° sector to the observer's back. This is not acceptable under Method 9.

** Not required at sulfuric acid plants by EPA standards.

Observer readings were made according to Method 9 against a contrasting background and were compared with the transmissometer readings. The results are as follows: A total of 298 sets of 25 readings were made. Two sets of readings were made with an average error of + 8 percent opacity. A total of nine sets of readings were made with an average error of + 5 percent opacity or greater. The remaining 289 sets of readings were made with errors of less than + 5 percent opacity.

In summary, a total of 636 runs of 25 readings each were made using white plumes and 133 runs of 25 readings each using black plumes for the specific purpose of quantifying the degree of positive error possible in Method 9. The readings were made against contrasting backgrounds, the condition under which a plume is most visible and is most conducive to positive observer errors. The results show that single observers, on the basis of single sets of 25 readings, are able to assign opacity with errors of less than + 7.5 percent with good consistency (630 of 636 for white plumes; 133 out of 133 for black plumes). Errors in excess of + 7.5 percent can occur, although very infrequently. In short, on the basis of this extensive research of the very sort demanded by PCA, observer readings of opacity have been shown to be within an error tolerance of + 7.5 opacity with a frequency of approximately 99.3 percent (763 of 769 total sets of observations). This indicates clearly that opacity observers do in fact meet the + 7.5 percent opacity accuracy limit which is specified explicitly in the introduction to (amended) Reference Method 9.

Finally with regard to observer accuracy and the inherent reliability of opacity readings, much of the concern of the Court of Appeals is related to PCA's contention, based on an HEW study,[6] that at low levels opacity readings cannot be made reliably. The Court notes[10] that PCA's claim that Table 2 on page 28 of that study shows that the six trained observers rated a plume known to have 0 percent opacity at more than 0 percent opacity, and three rated it at more than 20 percent. The Court notes further that a plume known to be 20 percent opacity was rated higher than 20 percent by five of the six observers, based also on Table 2.

A close reading of Table 2 shows, however, that Petitioners have wholly misconstrued the nature of that test and the data presented in Table 2. In fact, the study specifies that

> "tests of trained observers show that the observers that viewed white plumes on a clear day facing the sun assessed the plumes at a higher Ringelmann number (lower transmittance) than did observers that viewed the plumes with the sun to their backs. For darker, plumes the effect was less pronounced. Group assessments showed good agreement for similar sun-plume-viewer geometries"6 (emphasis added).

EPA agrees that viewing plumes while facing the sun may produce inaccurate readings. It is for this very reason that Reference Method 9[8] requires observations to be made with the sun at the viewer's back.

When Table 2 is examined in this regard, the "good agreement" for apparent similar geometries divides the observers into two groups. The first, consisting of Inspectors 1, 2, and 3, had similar readings among

themselves. The second group, consisting of Inspectors 4, 5, and 6, also had good agreement among themselves. The levels of the second group are significantly higher than those of the first group, indicating that the second group was viewing into the sun, while the first group (1, 2, and 3) was viewing with the sun to their backs. This probability is confirmed by the report itself, which states that no restriction was placed on viewing direction.[6] Since only Inspectors 1, 2, and 3 apparently made their observations with the sun at their backs, it is only their results that are at all relevant to the question of observational reliability or accuracy. These results, for the low levels of opacity concerning the Court, are reproduced below:

Table 2. AP-30, Evaluation of White Plumes[6]

In-stack transmittance, percent Equiv. Ring. No.	75% 1.00	90% 0
Insp. No. 1	1.03	0.03
Insp. No. 2	1.13	0.16
Insp. No. 3	0.97	0.17

It is at once apparent that the observations of Inspectors 1, 2, and 3 reflect a very high degree of accuracy, contrary to PCA's contentions. Closer examination of this table, moreover, shows that the data itself is presented in a way not corresponding with EPA's standards. It will be noted that each column is headed by two figures: the "equivalent Ringelmann No." and the "In-stack Transmittance, Percent." Transmittance, of course, represents the percentage of light not blocked by the smoke, so the 75 percent mittance is a 10 percent opacity. As the Court notes,[10] the presently

accepted equivalency between Ringelmann numbers and opacity of white smoke is 20:1, i.e. Ringelmann No. 2 = 40 percent opacity, Ringelmann No. 1 = 20 percent opacity, Ringlemann No. .5 = 10 percent opacity, Ringelmann No. 0 = 0 percent opacity, etc. The Table 2 column headings, however, reflect a different equivalency: there, Ringelmann No. 1 corresponds to 25 percent opacity (75 percent transmittance), and Ringelmann 0 corresponds to 10 percent opacity (90 percent transmittance). Since EPA's opacity standards are predicated upon and expressed in terms of the transmission and obscuration of light, it is therefore only the transmittance figures which are at all relevant to evaluating EPA's standards.

The discrepancy between the equivalency used in Table 2 and the presently accepted Ringelmann-opacity equivalency exists because during the middle nineteen-sixties when the data were obtained, there was little interest in reading low opacity plumes, since visible emissions standards were generally at about forty percent opacity. The tests were conducted with smoke readers at a smoke school where the Ringelmann Chart was considered the primary standard, and the school's smoke generator transmissometers were calibrated in terms of Ringelmann numbers (a procedure not used today). This nonlinear calibration resulted in white plumes below thirteen percent opacity being assigned a Ringlemann number of zero. Black plumes below five percent opacity were also assigned a Ringelmann number of zero.[11] It is clear therefore that this equivalency (now replaced by the standard 20:1 ratio) was not intended

to deal with low opacity plumes, since all six inspectors in fact reported seeing smoke at what was supposed to be Ringlemann zero.

As a result of these flaws, the data in Table 2 can only be partially converted to opacity percentages for purposes of evaluating observer accuracy and are not completely reliable for this purpose as the observations were not made in accordance with current procedures specified by Method 9. Since a definite ratio of 25:1.00 was used to calibrate the observers at the 25 percent level, those figures can be expressed as opacity percentages. The conversion for the 10 percent opacity column is less exact, but the fact that all observers did observe smoke with a known 10 percent opacity plume allows the use of the standard ratio (Ringelmann .5 = 10 percent opacity) as a close approximation for purposes of conversion. The results of this conversion appear below.

Table 2. AP-30, Evaluation of White Plumes[6]

In-stack transmittance, percent Opacity, percent	75% 25%	90% 10%
Inspector No. 1		
Ringelmann observed	1.03	0.03
Equivalent opacity	25.75%	0.6%
Inspector No. 2		
Ringelmann observed	1.13	0.16
Equivalent opacity	28.25%	3.2%
Inspector No. 3		
Ringelmann observed	0.97	0.17
Equivalent opacity	24.25%	3.4%

It is apparent from this more properly presented data that Table 2 in fact refutes, rather than supports, PCA's claims of unreliably

high readings at low levels of opacity. Indeed, the column which PCA treated as 0 percent opacity is in fact 10 percent opacity; in this column all three inspectors rated the opacity at well below its actual value. Likewise, the column which PCA treated as 20 percent is actually 25 percent opacity. In that column, all observers rated the opacity at values very close to the actual level, and well within the 7.5 percent opacity tolerance to which observers are limited by Method 9.

Because of the fundamental differences in the method of relating and calibrating Ringelmann numbers with equivalent opacity between the method used at the smoke school where the above data were gathered and the present approach used by EPA (as reflected in Method 9), the author of AP-30 states that the data in Table 2 cannot be used to assess the reliability of EPA's method or opacity readings in general.[5] The above discussion is therefore presented solely to demonstrate that, contrary to PCA's belief, those data do not in any way indicate the unreliability of EPA's use of qualified observers. The Agency is not relying on those data as part of its demonstration of the accuracy of Method 9.

In accordance with the Amoco case discussed above, this error tolerance of + 7.5 percent opacity must be acoounted for in the enforcement process, so that no source which is in fact in compliance with the applicable opacity standard is cited for a violation due merely to normal observational error. EPA has consistently maintained that it does in fact take this error tolerance into account in the enforcement

process. In an earlier draft response to this remand (November, 1973), for example, the Administrator stated that "the agency would not take, and the courts would not sustain, enforcement action based upon opacity observations that do not exceed the standard by more than the average opacity error associated with the particular opacity standard." PCA, however, has been unsatisfied by this assurance, apparently fearing that EPA in its enforcement decisions would ignore the established error tolerance. To provide the certainty desired by PCA and others, EPA is therefore now amending the applicable regulations (40 CFR 60, Appendix A, Reference Method 9) by adding an introductory section which discusses the concept of visible emission readings and describes the effect of variable viewing conditions. This section presents pertinent portions of the above data and notes specifically that the accuracy of the method must be taken into account when determining possible violations of applicable opacity standards. A copy of the revised regulation appears in Part B of Appendix III of this Response.

EPA is also now amending the provisions of Reference Method 9 to make clear that the determination of an opacity level reportable as a violation involves averaging 24 readings taken at 15-second intervals. This will make clear that a single high reading will not be cited as a violation. It will also ensure, as PCA requests, that such individual readings, which may result under normal plant operations from brief events such as shaking of fabric filter bags in baghouses or rapping of electrodes in electrostatic precipitators, will not result in

determinations of violation. This amendment to Reference Method 9 is set forth in Part B of Appendix III. (This approach is a satisfactory means of enforcing opacity standards in cases where the violation is a continuing one and time exceptions are not part of the applicable opacity standard. However, the opacity standards for steam electric generators in 40 CFR 60.42 and fluid catalytic cracking unit catalyst regenerators in 40 CFR 60.102 and numerous opacity standards in State Implementation Plans specify various time exceptions. Many State and local air pollution control agencies use a different approach in enforcing opacity standards than the six-minute average period specified in this revision to Method 9. EPA recognizes that certain types of opacity violations that are intermittent in nature require a different approach in applying the opacity standards than this revision to Method 9. It is EPA's intent to propose an additional revision to Method 9 specifying an alternative method to enforce opacity standards. It is our intent that this method specify a minimum number of readings that must be taken, such as a minimum of ten readings above the standard in any one hour period prior to citing a violation. EPA is in the process of analyzing available data and determining the error involved in reading opacity in this manner and will propose this revision to Method 9 as soon as this analysis is completed. The Agency solicits comments and recommendations on the need for this additional revision to Method 9 and would welcome any suggestions particularly from air pollution control agencies in how we might make Method 9 more responsive to the needs of these agencies.)

PCA also contends that the wind velocity during a given set of observations can affect the opacity levels read by observers. EPA agrees that this is true. However, as is the case with lack of contrasting background in viewing a plume, the result of high winds is a negative error in reading the opacity of the plume; this results from the dissipation of the plume caused by the wind. Since a negative error in reading the opacity of the plume cannot prejudice an operator, this consideration is not relevant to the reliability of the method for assessing violations of the opacity standards.

PCA contends that the viewing angle of the observer with respect to the sun and the plume can produce erroneously high readings; if the observer reads the plume while facing the sun, PCA says, such high reading may result. EPA agrees, as was noted above, and for this reason Reference Method 9 has always required the observer to read the plume with the sun at his back. Reference Method 9 is now being amended to include even more specific criteria concerning observer position with respect to the sun. The method will now require that the sun shall be within a 140° sector to the observer's back. This amendment appears in Part B of Appendix III.

The final aspect of opacity observations with which PCA and the Court of Appeals were concerned is the procedure employed by qualified observers to evaluate plumes containing condensed (visible) water vapor, or "steam plumes." When stack emissions contain appreciable water vapor, the vapor becomes visible when the gases are cooled below the dew point

and water condenses in fine droplets. Some steam plumes are detached while others are visible as released from the stack.*** However, since ambient air is normally much drier than stack emissions containing visible water vapor, dilution causes the gases at some point to become unsaturated. At this point, condensed water evaporates and is no longer visible in the plume. PCA contends that these plumes cannot be read properly, and the Court of Appeals also notes concern over the way in which steam plumes are to be read. This issue was addressed in part in the report titled "A Report on Contaminated Water Vapor Plumes."[24] As EPA has previously noted, instruction is given in the smoke school as to how such plumes are to be read; the above report illustrates how qualified observers can readily distinguish the point at which all visible water vapor has evaporated from the plume. It is this point at which the opacity reading is made. Since the plume has been somewhat dissipated by that point, the reading is often lower than that which would have been found at the lip of the stack, had the plume been free from visible water vapor. This error is negative, however, and in no way prejudices the plant operator. EPA agrees, however, that the prior language of Method 9 did not sufficiently make this procedure clear. Method 9 is therefore now being amended to remedy that deficiency;

*** The phenomenon of a "detached plume" is often observed when a warm, moist gas stream is released into a cooler atmosphere, e.g. when hot, wet exhaust gases from a wet process kiln are released to the atmosphere. Here the gases are clear at the point of discharge but become opaque as the wet gases mix with cooler air in the atmosphere.

when the new guidelines are adhered to (as they were in the past, though not formally articulated in the Method), any errors due to the presence of water vapor can be eliminated. These amendments appear in Part B of Appendix III.

In addition to proposing specific procedures, EPA is currently investigating techniques which could be employed in the smoke school to further enhance an observer's capability to accurately identify contaminated water plumes. This investigation is being undertaken by a contractor--Pacific Environmental Services, Inc.--and by EPA staff as part of an overall program to develop further guidelines concerning opacity training and field observation.[12] Procedures used by State and local regulatory agencies to observe contaminated water vapor plumes are being reviewed, and the use of such training aids as movies and apprenticeship training will be considered.

The basic question involved is not whether an observer can accurately assign opacity to a contaminated water plume, but rather is whether an observer can distinguish between condensed water vapor and visible particulate matter. To accurately evaluate wet plumes pursuant to revised Method 9, it is necessary only for an observer to distinguish between condensed water vapor and visible particulate air pollutants. In no case is the observer required to assign an opacity to a plume which contains visible (condensed) water droplets.[13]

As noted in the previously cited report, water plumes present an entirely different appearance to an observer than a dust plume. A

trained air pollution inspector is familiar with both types of plumes, and has no difficulty distinguishing between the two. While much of his ability in this area stems from smoke school training, his background in inspecting industrial processes is also a factor. Inspectors employed by control agencies are required to become familiar with a broad spectrum of sources and to evaluate opacities from them under all weather conditions. For instance they know which sources employ scrubbers, which cement plants employ wet and dry process systems and generally which sources tend to produce wet plumes. They also know that extreme weather conditions can create visible water plumes at sources which release only negligible particulate matter, e.g. natural gas-fired boilers and water heaters. Thus, when a trained air pollution inspector evaluates a wet plume source he relies on all of this background in making a judgment. In following Method 9 he first identifies that portion of the plume which contains condensed water. As explained in the previously cited report, fluffy water plumes may trail 100 feet or more from the stack.[24] When the water plume disappears, he evaluates the opacity of the remaining dust plume which, if of violating opacity, will persist for a much longer distance. At this point, when water droplets evaporate and cease to be visible, the dust plume has been diluted considerably below the concentration at the stack exit. Only if the dust plume is still of greater than allowed opacity at the point of complete evaporation can an inspector consider a citation of violation. His normal procedure is to enter the plant and evaluate the process

operation before in fact issuing the notice of violation. Thus it is obvious that the procedure allows a great deal of latitude to the operator of a wet plume process. Far from citing unjustly for violative visible emissions, the air pollution inspector will often be forced to ignore periods of marginal violations simply because the visible dust plume is masked by visible water droplets.

The revisions in Reference Method 9 make clear that the above procedure is to be followed.[8] For attached steam plumes, the observer is to make his readings at the point where all visible water vapor has evaporated and only particulates remain in the plume. He is to record the reading made at that point in the plume, and is not (as PCA fears) to extrapolate back to any hypothetical value at the lip of the stack. For detached steam plumes, the observer is to read the opacity value as usual at the lip of the stack, providing that no visible water vapor is present there, i.e. providing that there is a gap between the lip of the stack and the point of initial condensation into steam.

EVALUATION OF SMOKE SCHOOL PROCEDURES

The purpose of a smoke school is two-fold. It provides a means for training an observer, and for certifying that an observer is, in fact, capable of making opacity observations with reasonable accuracy. In this sense, the school serves to calibrate (or re-calibrate) observers, and rejects candidates who are not capable of accurately reading opacity. The question of whether the school adequately serves these purposes cannot primarily be answered by examining the procedures used. Rather, it is necessary to examine the accuracy of observers who have been trained and certified in the school, i.e., the results of those procedures. If, as the data discussed earlier demonstrate, qualified observers can read plumes with reasonable accuracy, the procedures and instruction used at the smoke school must, by definition, be accomplishing the desired results.

With regard to PCA's criticism concerning the ability of an observer to accurately read emissions under various field conditions which were not encountered in the training school, it is necessary to refer again to the factors affecting apparent opacity. As discussed above, observations made under conditions of high contrast are most conducive to positive errors. To the extent possible, observers employ contrasting backgrounds during qualification. It is true that this procedure may tend to limit the accuracy of an observer under less than ideal conditions. However, since a plume will present an appearance of lower opacity under such conditions, the resulting bias will be negative. As discussed above, this effect is confirmed by theory and by field observation.

PCA has noted the fact that smoke school trainees are given repeated opportunities to pass the certification test. Thus, an observer may be certified on one run even though the certification criteria were not met on previous runs. Presumably, he could also fail to meet the criteria on subsequent runs. Petitioners are correct in this description--particularly when new or relatively inexperienced persons are being tested. It does not follow, however, that the smoke school procedures are deficient or inadequate in this respect. First, as noted above, the adequacy of the smoke school cannot be determined solely by reviewing the procedures; evaluation can also be made by testing the ability of observers who have passed the certification test. Secondly with respect to the certification procedures, it should be recognized that the $\pm$7.5% criterion is particularly restrictive in that it involves the absolute error, not simply the average taken over 25 readings. Thus, negative and positive errors are not compensating (i.e., a -5% error and a +7 error result in an average absolute error of +6%). This is unlike the field observation procedure where negative and positive errors are compensating (a -5% error and a +7 error result in an average error of +1%). During an EPA smoke school conducted on October 9, 1974, a record was kept for all observers who attended and were certified.[9] This record includes both runs during which the observers passed the certification criteria and during which observers failed to meet the criteria. These data show that even on these runs when observers failed to qualify, over two-thirds of them met

7.5% average error limit imposed by Method 9.[9] Since the Reference Method 9 involves an average of 24 readings as a means of determining plume opacity, failure to continuously meet the more stringent certification requirements is relatively unimportant as long as the average reading is consistently within the prescribed criterion of less than +7.5% average opacity. For example, the requirement that no single reading be missed by more than ±15 percent is somewhat arbitrary, and could be relaxed to ±20 percent to reduce the number of observers failing the certification test. EPA has concluded, however, that the stringent certification criterion serves the intended purpose of forcing a trainee to learn to assign opacity within a reasonable range of precision and therefore should not be relaxed. EPA has further concluded, in summary, that while any changes recommended by the contractor Pacific Environmental Services will be carefully considered, the training program does in fact effectively train observers to read plumes under field conditions with reasonable accuracy.

Summary

EPA believes that the above data have convincingly demonstrated that the opacity standards are inherently reliable.**** The data show that observers can, with a very high confidence level, read plumes to within the certified error tolerance of 7.5%. That tolerance is taken into account in the enforcement process, as provided

**** A New Jersey court has recently reached the same conclusion. See New Jersey v. LLoyd A. Fry Roofing Co., Docket no. C-3682-72 (Superior Court, Sept. 30, 1974).

explicitly by the (amended) regulations. EPA further believes that the effectiveness of the training program is well proven by the resulting accuracy of its graduates under actual field conditions. In those few situations where the language of the regulations or Reference Method 9 was insufficiently clear or inadequate, those regulations are being or have been amended to remedy such deficiencies. The Administrator concludes, therefore, that since the concerns of the Court of Appeals and the Portland Cement Association in this regard have all been satisfactorily dealt with, the Agency should continue to use opacity standards for new sources under Section 111 of the Clean Air Act. EPA does, however, recognize that some operators of Portland cement plants may install in-stack transmissometers for the purpose of continuous monitoring of particulate emissions.[14] EPA will therefore accept as probative (though not conclusive) evidence the results of such continuous monitoring by transmissometer which indicate that the opacity at the time readings were taken by Reference Method 9 was not in excess of the standard, provided that the source shall meet the burden of proving that the instrument used meets (at the time of the alleged violation) the applicable technical specifications,[14] has been properly maintained and (at the time of the alleged violation) calibrated, and that the resulting data have not been tampered with in any way. The applicable regulations are being amended to reflect this provision and appear in Part B of Appendix III.

EPA will of course continue to review the degree of accuracy and need for opacity measurements as new data and information are acquired. For example, at the request of the Department of Commerce, EPA solicited such information in the preamble to new source performance standards recently proposed (39 FR 37466). However, at this time the data and information available to EPA support the position taken in this response.

ACHIEVABILITY OF THE OPACITY STANDARDS FOR PORTLAND CEMENT PLANTS

Under Section 111 of the Clean Air Act, EPA has established 10 percent opacity as the standard which may not be exceeded by new kilns at Portland cement plants. PCA contends that some new plants will or may be unable to achieve compliance with this visible emissions limit. EPA policy is that opacity limits should be set at such levels that any source which meets the mass emission limits will also meet the opacity limits. EPA has conducted an intensive review of its opacity standards, including conducting new tests and gathering new data, and has concluded that although the 10% opacity standard is achievable by almost all new Portland cement plants, that standard should nevertheless be relaxed to 20% opacity to accomodate certain extreme circumstances. EPA further concludes that at this new level, practical circumstances under which any combination of the factors cited by PCA or the Court as having a possible effect on opacity (transmittance) of smoke plumes that could cause a new source to be unable to meet the opacity standard is exceedingly rare. The

reasons for these conclusions are set forth below.

PCA contends that the opacity standards for Portland cement plants are unachievable for two primary reasons, both related to the theory of transmittance of light through a plume. PCA states, first, that opacity varies with particle size and shape, so that a given mass concentration of particles -- which could be composed of various combinations of different size and shape particles -- could result in differing opacities. EPA agrees that this correctly states the theory of plume transmittance (opacity) as it relates to particle dimensions. PCA concludes from this statement of theory, disregarding the results of the application of the theory to operation of Portland cement plants, that such plants might have widely varying opacities while still meeting the mass emission limits. It is with PCA's conclusion that EPA disagrees. The relevant question is what variations in opacity are <u>in fact</u> produced by the particle size-shape distributions <u>actually present</u> in Portland cement plants under normal operation and with proper maintenance and operation of pollution control equipment. It is this question which is next addressed.

It is known from various studies and experience that uncontrolled gases vented from cement kilns contain heavy concentrations of coarse as well as fine particlate, i.e., in the range of 5 to 15 grains per standard cubic foot.[15] Standards of performance for new sources requiring best available technology, necessitate the installation of high efficiency collectors. Collectors of 99.4 to 99.8 percent efficiency are necessary to reduce exit concentrations to approximately

0.03 grains per standard cubic foot which is necessary to meet the mass emission standard. These collectors, fabric filters or electrostatic precipitators, are more effective in removing coarse particles than fine particles. Thus emissions from collectors, i.e., visible emissions, tend to be made up of much greater fractions of fine particulates than coarse particulates.

In typical high efficiency collector exhaust gases there are generally few particulates larger than 40 microns diameter.[16, 17] The predominant number of particles are between 0.5 and 10 microns with the average size being about 2-4 microns.[2,17] Maximum light scattering is generally acknowledged to be caused by particles in the size range of 0.2 to 2.0 micron.[6,17] Available data indicate that the size distribution of particulates released from well controlled cement kilns are similar within a narrow range (approximately 2 to 6 microns) from one kiln to another, and therfore from one plant to another.[17]

What the above data and studies indicate, in short, is that the size of particles emitted by plants with such control equipment varies only within a very narrow range. This variability in average size is theoretically not sufficient to cause more than a $\pm$ 5 percent variation in opacity for typical cement kilns.[6] These data are wholly incompatible with PCA's speculation that widely varying particle sizes might produce much larger variations in opacity at cement plants meeting the mass emission standard.

The shape of particles emitted from well-controlled portland cement plants may vary as PCA contends. However, we disagree with their conclusions that such variations in shape would affect the

opacity of emissions perceived by a qualified observer or in-stack transmissometer. Any irregularly shaped particles would be randomly oriented thereby smoothing or averaging out any significant variations of opacity that could possibly result. In addition, it is likely that the particles will be abraded or will condense into spherical shapes for the following reasons: 1) feed materials are ground to less than 75 microns in almost all cases; 2) further attrition and size reduction occurs as the feed material passes through the high temperature rotating kiln; and 3) alkaline material tends to vaporize and condense as a fume.[15,16,17]

Also, the recent microscopic examination of particles from the exhaust gases of a precipitator controlled kiln showed that almost all particles were approximately spherical in shape.[2]

Given that particle size and shape do not vary to the extent necessary to substantiate PCA's speculation, it is apparent that normal operations even from plant to plant will not produce variations sufficient to significantly affect the opacity observed at the point of emission from the stack. Therefore, if the opacity standards are set in accordance with the opacity actually produced by normal operations, then with proper maintenance and operation of control equipment the very slight variations which may occur from plant to plant or from time to time within an individual plant will not cause the source to exceed the opacity standard. And if, for any reasons, some unusual design feature of a given plant caused it to exceed the opacity standard but not the mass emission

standard, the variance procedure described below would eliminate any prejudice to such source.

The second major factor which PCA claims affects opacity (transmittance) to the extent that some plants may exceed the opacity standard while meeting the mass emission standard is the diameter of the duct involved; i.e., the path length through which the light must pass. EPA agrees that the greater the path length through which the light must pass, the more light will be attenuated, and the greater will be the opacity. EPA again disagrees, however, with PCA's conclusion, which is again in disregard of the actual circumstances of plant design and operation, that some plants will therefore be unable to meet the opacity standards, though meeting the mass standard. EPA believes that the proper issue in this regard is the actual range of stack diameters resulting from the engineering and economic necessities of plant design. This question is addressed below.

Stack diameter affects opacity directly because it governs the length of the path through which the light is attenuated before it reaches the observer viewing the plume. The larger the diameter of the stack, and therefore the plume, the more light will be attenuated as it passes through the plume, and the greater will be the opacity of the plume. Stacks venting high efficiency control equipment, such as that serving kilns at portland cement plants, are designed to ventilate the process to the degree necessary with the minimum pressure drop and at the lowest cost. These engineering and economic factors result in the construction of stacks in which

the gas velocities approximate 30 to 100 feet per second, since at higher velocities friction losses become excessive, necessitating much larger horsepower fans. At lower velocities, the size of the stack required would result in disproportionately large capital costs. Thus, stack diameter tends to be directly related to and characteristic of plant size, varying only within a relatively limited range.

Stack gas exit velocity is controlled by stack diameter. Exit velocity is directly proportional to the volume of gases vented from a kiln and inversely proportional to the cross-sectional area of the stack. For plumes of a given cross-section, velocity has no effect upon opacity, since opacity is a function of path length and is proportional to the concentration and characteristics of particles in the gas stream. The velocity at which the gas stream moves through the viewer's line of vision has no effect on opacity.

It follows, therefore, that an extremely large diameter stack could theoretically be installed at a cement plant, even though its cost would be much greater than normal. In the course of EPA's survey of the cement industry, the largest size kiln stack that has come to our attention is 15 foot in diameter. In the unlikely event that larger stacks were used or other abnormal conditions of design or operation were encountered that could cause a violation of an applicable opacity standard, EPA would evaluate opacity during the performance tests for the mass emission standard. If it were shown necessary, a suitable opacity level greater than

20 percent would be established for that specific kiln installation. Although such an eventuality is highly unlikely, appropriate language is being promulgated in the general provisions of the regulation to accomodate such situations and appears in Part B of Appendix III.

EPA concludes, on the basis of the actual stack diameters employed by the industry, that stack diameter will not cause a plant meeting the mass emission standard to exceed the opacity standard. To deal with the uncertainties cited by PCA as to how plumes from baghouses with stub stacks are to be read, EPA is revising Method 9 to specify that a row of such stub stacks, or any non-circular stack, is to be read along its shortest axis (perpendicular to its longer axis). This ensures that the shorter path length will be used to determine opacity, and will eliminate any concern that a long row of stub stacks, common on baghouses, might be read along its long axis, producing higher opacity.

Given that particle size-shape and stack diameter do not produce opacity variations sufficient to cause a source which might otherwise meet the opacity standard, and which is meeting the mass standard, to exceed the opacity standard, the only remaining issue is whether well-controlled portland cement plants can, in fact, meet the opacity standard. EPA has accumulated data for portland cement plant kilns that are vented to high efficiency control equipment that is properly designed, operated and maintained. These data are summarized in Table I. Opacity readings were also taken of

Table I

Particulate Emissions[2,19-23]

Name of the Company, Date of Test and Type Control Equipment	Test Duration	lbs/ton of dry feed	Stack Dia.	Average Opacity	Max. Single Reading
Dragon Cement Co. Northampton, Pa. 4/29-30/71 Baghouse	6 hours	0.070	11'0"	<10	<10
Oregon Portland Cement Co. Lake Oswego, Oregon 10/7-8/71 Baghouse	6 hours	0.272	4'4" (velocity cone)	<10	<10
Santee Portland Cement Co. Holly Hill, S. C. 5/23-25/74 Electrical Precipitator	8 hours - 2 minutes	0.107	12'0"	0	0
United Portland Cement Co. Artesia, Miss. 6/25-27/74 Electrical Precipitator	8 hours - 23 minutes	0.209	11'3"	<5	<5
Monarch Cement Co. Humboldt, Kansas 6/12-14/74 Baghouse	12.5 minutes	0.196	7'0"	3.8	5
Marquette Cement Co. Neville Island, Pa. 6/19-21/74 Electrical Precipitator	9 hours - 0 minutes	0.339	12'6"	18*	---

*Based on transmissometer data.

several additional well controlled portland cement plant kiln stacks by an EPA contractor.[18] Mass emission tests were not conducted in these instances, however, in light of the petitioners contention that the mass standards are overly restrictive, it would seem unlikely that these plants would be operating significantly below the mass emission standard. A summary of these installations is shown in Table II.

Table II

Opacity of Visible Emissions from Cement Kilns Controlled by Fabric Filters[18]

Name of Company Date of Test and Control Equipment	Duration of Test (hours, min.)	Stack Size (feet)	Average Opacity (percent)	Maximum 6-Minute Average Opacity	Maximum Single Reading
Whitehall Cem Cementon, Pa. 7/29 & 8/1/74 Baghouse	8h 2m	15' dia. (1 stack)	0	0.2	5
Coplay (Egypt) Cement Co. Egypt, Pa. 7/29-31/74 Baghouse	7h 15m	4'10" dia. each. (7 stacks)	0	3.8	5
Hercules Cement Co. Stockerton, Pa. 7/29 & 8/2/74	5h 16m	13' dia. (1 stack)	0	0	0
		2'x1' each. (12 stacks)	0	0	0
Penn-Dixie Cement Co.* Nazareth, Pa. 7/29-30/74 Baghouse	7h 55 m	5'x11' each with center divider. (8 stacks)	10-15	15	25

*These observations were taken across the shorter axis of the eight stacks (40' pathlength). If the observations had been taken across the longer axis of any one stack, the pathlength would have been 11 feet. The estimated maximum 6-minute average opacity under these latter conditions would be 4.4 percent rather than 15 percent. Likewise, the maximum single reading would be 7.5%. Reference Method 9 now requires these observations to be made across the 11' axis.

With the exception of Marquette Cement Co. all of the kilns identified in Table I were operating below the mass and opacity standards promulgated in 1971 (i.e., 0.3 lb/ton of dry feed and 10%). The data for Marquette Cement Co. indicate that the kiln was not in compliance with the mass emission standard (0.339 versus 0.3 lb/ton of dry feed). The opacity data were collected with an in-stack transmissometer. The stack diameter is 12'6", the average opacity during the mass emission tests was 18%, and the average size of emitted particles was determined to be approximately 2 microns diameter.[2] If the stack diameter were 15', which is the largest diameter stack EPA has observed on cement plants, the average opacity would have been 21%. The mass emission tests for Marquette Cement Co. consisted of three separate runs. The results of the three runs are:

Table III

Opacity and Mass Emissions for a Kiln[2,3]

Run Number	Particulate Emissions, lbs/tons of dry kiln feed	Average opacity (percent) at actual stack conditions (12'6")	Average opacity (percent) extrapolated to 15' diameter stack conditions
1	0.386	22	25
2	0.339	17	20
3	0.292	15	18

The particulate matter emissions from Marquette Cement Co. were analyzed to determine the particle size distribution. This analysis indicated that the average particle diameter was approximately 2 microns

which is very low for portland cement plants. These data indicate that for a plant with an unusually large stack diameter and with particulate emissions having very small average particle diameter properties, a 20% opacity standard is more reasonable than a 10% standard. The achievability of a 20 percent standard is amply demonstrated by the data in Tables I and II which illustrate that most portland cement kilns have no difficulty in meeting even a 10 percent opacity standard. The Marquette Cement Company test results illustrate that even under the combination of conditions that would produce the maximum obscuration of light (i.e., large stack diameters, small average particle sizes, and concentrations near the mass emission standard), a 20 percent standard (Table III, run number 3) would be achieved. It should be additionally noted that the combination of conditions for maximum opacity, even though accommodated by the 20 percent standard, will occur infrequently. Therefore, it is concluded that a plant with a 15' diameter stack which meets the mass emission standard will also meet a 20% opacity standard and when it exceeds the mass emission standard will exceed the opacity standard. For stacks smaller than 15 feet in diameter, a portland cement kiln that violates a 20% opacity standard will also violate the mass emission standard by a substantial amount. Data in Table II show that in several cases, opacity of emissions from well controlled cement kilns are appreciably less than 20% even where larger stacks are employed e.g., 0.2% from a 15 foot diamater stack and zero from a 13 foot diameter stack. Based on these data and EPA's policy that opacity standards be established at levels which require proper operation

and maintenance of control systems, the opacity standard for portland cement plant kilns is being changed from 10 to 20 percent. This change appears in Part B of Appendix III.

In addition to considerations of the average opacity standards, EPA has evaluated the need for possible time exemptions in the opacity standard. It is recognized that during normal operation of portland cement kilns, process variations, shaking of bags in baghouses, rapping of electrodes in electrical precipitators, etc., can produce mass emissions that are not perfectly constant. It follows that slight variations in opacity can also occur under these conditions. However, with the clarification to Method 9 whereby a minimum of 24 opacity readings must be taken at 15 second intervals over a 6 minute period and with the averaging of observations for determining compliance with the opacity standard, it is apparent that such instantaneous opacity readings will not constitute a violation of the standard. Changing the opacity standard for portland cement kilns from 10 to 20 percent further ensures that such temporary incidents will not cause the opacity standard to be exceeded. Since the change in the opacity standard merely represents a relaxation of the standard, it will be applicable to all sources which commenced construction subsequent to the promulgation of the original, more stringent level. To an even greater degree than the 10% standard, this 20% standard is significantly less stringent than the mass emission limit for portland cement kilns.

As discussed in this remand response, the change of the opacity standard from 10 percent to 20 percent was made to insure that no plant that is meeting the mass emission standard is cited for violating the opacity standard. It does not change the degree of particulate control required of new portland cement plants. Accordingly, this relaxation of the opacity standard does not require an environmental impact statement.

References

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12. Task Order: Preparation of Guideline for Evaluation of Visible Emission Opacity by Trained Observers. EPA Contract No. 68-02-1390, Task 2, June 5, 1974.

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14. Federal Register: 39 FR 32852, September 11, 1974.

15. R. Emmet Doherty. Current Status and Future Prospects - Cement Mill Air Pollution Control. Proceedings, The Third National Conference on Air Pollution, Washington, D. C. December 12-14, 1966.

EXCERPTS FROM CODE OF FEDERAL REGULATIONS

TITLE 40 PROTECTION OF ENVIRONMENT

§ 60.8 Performance tests.

(a) Within 60 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup of such facility and at such other times as may be required by the Administrator under section 114 of the Act, the owner or operator of such facility shall conduct performance test(s) and furnish the Administrator a written report of the results of such performance test(s).

(b) Performance tests shall be conducted and data reduced in accordance with the test methods and procedures contained in each applicable subpart unless the Administrator (1) specifies or approves, in specific cases, the use of a reference method with minor changes in methodology, (2) approves the use of an equivalent method, (3) approves the use of an alternative method the results of which he has determined to be adequate for indicating whether a specific source is in compliance, or (4) waives the requirement for performance tests because the owner or operator of a source has demonstrated by other means to the Administrator's satisfaction that the affected facility is in compliance with the standard. Nothing in this paragraph shall be construed to abrogate the Administrator's authority to require testing under section 114 of the Act.

(c) Performance tests shall be conducted under such conditions as the Administrator shall specify to the plant operator based on representative performance of the affected facility. The owner or operator shall make available to the Administrator such records as may be necessary to determine the conditions of the performance tests. Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions of performance tests unless otherwise specified in the applicable standard.

(d) The owner or operator of an affected facility shall provide the Administrator 30 days prior notice of the performance test to afford the Administrator the opportunity to have an observer present.

(e) The owner or operator of an affected facility shall provide, or cause to be provided, performance testing facilities as follows:

(1) Sampling ports adequate for test methods applicable to such facility.

(2) Safe sampling platform(s).

(3) Safe access to sampling platform(s).

(4) Utilities for sampling and testing equipment.

(f) Each performance test shall consist of three separate runs using the applicable test method. Each run shall be conducted for the time and under the conditions specified in the applicable standard. For the purpose of determining compliance with an applicable standard, the arithmetic means of results of the three runs shall apply. In the event that a sample is accidentally lost or conditions occur in which one of the three runs must be discontinued because of forced shutdown, failure of an irreplaceable portion of the sample train, extreme meteorological conditions, or other circumstances, beyond the owner or operator's control, compliance may, upon the Administrator's approval, be determined using the arithmetic mean of the results of the two other runs.

[36 FR 24877, Dec. 23, 1971, as amended at 38 FR 28565, Oct. 15, 1974; 39 FR 9314, Mar. 8, 1974]

* * *

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Subpart D—Standards of Performance for Fossil-Fuel Fired Steam Generators

* * *

§ 60.42 Standard for particulate matter.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which:

(1) Contain particulate matter in excess of 0.18 g per million cal heat input (0.10 lb per million Btu) derived from fossil fuel.

(2) Exhibit greater than 20 percent opacity except that a maximum of 40 percent opacity shall be permissible for not more than 2 minutes in any hour. Where the presence of uncombined water is the only reason for failure to meet the requirements of this paragraph, such failure will not be a violation of this section.

[39 FR 20792, June 14, 1974]

Subpart E—Standards of Performance for Incinerators

* * *

§ 60.52 Standard for particulate matter.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this part shall cause to be discharged into the atmosphere from any affected facility any gases which contain particulate matter in excess of 0.18 g/dscm (0.08 gr/dscf) corrected to 12 percent CO_2.

[39 FR 20792, June 14, 1974]

Subpart F—Standards of Performance for Portland Cement Plants

* * *

§ 60.62 Standard for particulate matter.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any kiln any gases which:

(1) Contain particulate matter in excess of 0.15 kg per metric ton of feed (dry basis) to the kiln (0.30 lb per ton).

(2) Exhibit greater than 10 *percent opacity.

(39 FR 20793, June 14, 1974)

*Amended to 20% (39 FR 39874, Nov. 12, 1974)

Subpart I—Standards of Performance for Asphalt Concrete Plants

SOURCE: 39 FR 9314, Mar. 8, 1974, unless otherwise noted.

* * *

§ 60.92 Standard for particulate matter.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall discharge or cause the discharge into the atmosphere from any affected facility any gases which:

(1) Contain particulate matter in excess of 90 mg/dscm (0.04 gr/dscf).

(2) Exhibit 20 percent opacity, or greater. Where the presence of uncombined water is the only reason for failure to meet the requirements of this paragraph, such failure shall not be a violation of this section.

EXCERPT FROM 37 FEDERAL

REGISTER 5767, MARCH 21, 1972

STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

Supplemental Statement in Connection With Final Promulgation

In the case of cement plants, holding to the same allowable emission rate while changing the sampling method results in a slight relaxation of the standard. This permits an electrostatic precipitator as well as a fabric filter to meet the emission standard.

• • • • •

5. *Particulate standards for kilns in portland cement plants.* Particulate emission limits of 0.3 pound per ton of feed to the kiln were proposed for cement kilns. This is roughly equivalent to a stack gas concentration of 0.03 grains per standard cubic foot.

The Portland Cement Association, American Mining Congress, a local control agency and the major cement producers commented that the kiln standard was either too strict or it is not based on adequately demonstrated technology, i.e. fabric filters can not be used for all types of cement plants. On the other hand, a comment was received from an equipment manufacturer stating that equipment other than fabric filters also can be used to meet the standard and citing supportive data for electrostatic precipitators. In addition, the AMC, a local agency and cement producers commented that the particulate standards for cement kilns are stricter than those promulgated for power plants and municipal incinerators. Further they objected to the test method to be used to determine compliance.

The proposed standard was based principally on particulate levels achieved at a kiln controlled by a fabric filter. Several other kilns controlled by fabric filters had no visible emissions but could not be tested due to the physical layout of the equipment. After proposal, but prior to promulgation a second kiln controlled by a fabric filter was tested and found to have particulate emissions in excess of the proposed standard. However, based on the revised particulate test method, the second installation showed particulate emissions to be less than 0.3 pound per ton of kiln feed.

The promulgated standard is roughly equivalent to a stack gas concentration of 0.03 grains per standard cubic foot. The power plant standard is equivalent to 0.06 grains per standard cubic foot at normal excess air rates. The incinerators standard is 0.08 grains per standard cubic foot corrected to 12 percent carbon dioxide. Uncorrected, at normal conditions of 7.5 percent carbon dioxide it is equivalent to 0.05 grains per standard cubic foot. The difference between the particulate standard for cement plants and those for steam generators and incinerators is attributable to the superior technology available therefor (that is, fabric filter technology has not been applied to coal-fired steam generators or incinerators).

In sum, considering the revision of the particulate test method, there are sufficient data to indicate that cement plants equipped with fabric filters and precipitators can meet the standard.

EXCERPTS FROM THE ADMINISTRATIVE PROCEDURE ACT, TITLE 5 UNITED STATES CODE

§ 553. Rule making

(a) This section applies, according to the provisions thereof, except to the extent that there is involved—

(1) a military or foreign affairs function of the United States; or

(2) a matter relating to agency management or personnel or to public property, loans, grants, benefits, or contracts.

(b) General notice of proposed rule making shall be published in the Federal Register, unless persons subject thereto are named and either personally served or otherwise have actual notice thereof in accordance with law. The notice shall include—

(1) a statement of the time, place, and nature of public rule making proceedings;

(2) reference to the legal authority under which the rule is proposed; and

(3) either the terms or substance of the proposed rule or a description of the subjects and issues involved.

Except when notice or hearing is required by statute, this subsection does not apply—

(A) to interpretative rules, general statements of policy, or rules of agency organization, procedure, or practice; or

(B) when the agency for good cause finds (and incorporates the finding and a brief statement of reasons therefor in the rules issued) that notice and public procedure thereon are impracticable, unnecessary, or contrary to the public interest.

(c) After notice required by this section, the agency shall give interested persons an opportunity to participate in the rule making through submission of written data, views, or arguments with or without opportunity for oral presentation. After consideration of the relevant matter presented, the agency shall incorporate in the rules adopted a concise general statement of their basis and purpose. When rules are required by statute to be made on the record after opportunity for an agency hearing, sections 556 and 557 of this title apply instead of this subsection.

(d) The required publication or service of a substantive rule shall be made not less than 30 days before its effective date, except—

(1) a substantive rule which grants or recognizes an exemption or relieves a restriction;

(2) interpretative rules and statements of policy; or

(3) as otherwise provided by the agency for good cause found and published with the rule.

(e) Each agency shall give an interested person the right to petition for the issuance, amendment, or repeal of a rule. Pub.L. 89–554, Sept. 6, 1966, 80 Stat. 383.

§ 706. Scope of review.

To the extent necessary to decision and when presented, the reviewing court shall decide all relevant questions of law, interpret constitutional and statutory provisions, and determine the meaning or applicability of the terms of an agency action. The reviewing court shall—

(1) compel agency action unlawfully withheld or unreasonably delayed; and

(2) hold unlawful and set aside agency action, findings, and conclusions found to be—

(A) arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law;

(B) contrary to constitutional right, power, privilege, or immunity;

(C) in excess of statutory jurisdiction, authority, or limitations, or short of statutory right;

(D) without observance of procedure required by law;

(E) unsupported by substantial evidence in a case subject to sections 556 and 557 of this title or otherwise reviewed on the record of an agency hearing provided by statute; or

(F) unwarranted by the facts to the extent that the facts are subject to trial de novo by the reviewing court.

In making the foregoing determinations, the court shall review the whole record or those parts of it cited by a party, and due account shall be taken of the rule of prejudicial error. (Pub. L. 89-554, Sept. 6, 1966, 80 Stat. 393.)

EXCERPTS FROM THE CLEAN AIR ACT OF 1967
(84 Stat. 1705, et seq.)

§ 1857. Congressional findings; purposes of subchapter.

* * * * *

(b) The purposes of this subchapter are—

(1) to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population;

* * * * *

§ 1857c-6. Standards of performance for new stationary sources.

(a) Definitions.

For purposes of this section:

(1) The term "standard of performance" means a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction) the Administrator determines has been adequately demonstrated.

(2) The term "new source" means any stationary source, the construction or modification of which is commenced after the publication of regulations (or, if earlier, proposed regulations) prescribing a standard of performance under this section which will be applicable to such source.

(3) The term "stationary source" means any building, structure, facility, or installation which emits or may emit any air pollutant.

(4) The term "modification" means any physical change in, or change in the method of operation of, a stationary source which increases the amount of any air pollutant emitted by such source or which results in the emission of any air pollutant not previously emitted.

(5) The term "owner or operator" means any person who owns, leases, operates, controls, or supervises a stationary source.

(6) The term "existing source" means any stationary source other than a new source.

(b) Publication and revision by Administrator of list of categories of stationary sources; inclusion of category in list; proposal of regulations by Administrator establishing standards for new sources within category; promulgation and revision of standards; differentiation within categories of new sources; issuance of information on pollution control techniques; applicability to new sources owned or operated by United States.

(1)(A) The Administrator shall, within 90 days after December 31, 1970, publish (and from time to time thereafter shall revise) a list of categories of stationary sources. He shall include a category of sources in such list if he determines it may contribute significantly to air pollution which causes or contributes to the endangerment of public health or welfare.

(B) Within 120 days after the inclusion of a category of stationary sources in a list under subparagraph (A), the Administrator shall propose regulations, establishing Federal standards of performance for new sources within such category. The Administrator shall afford interested persons an opportunity for written comment on such proposed regulations. After considering such comments, he shall promulgate, within 90 days after such publication, such

standards with such modifications as he deems appropriate. The Administrator may, from [time] to time, revise such standards following the procedure required by this subsection for promulgation of such standards. Standards of performance or revisions thereof shall become effective upon promulgation.

(2) The Administrator may distinguish among classes, types and sizes within categories of new sources for the purpose of establishing such standards.

(3) The Administrator shall, from time to time, issue information on pollution control techniques for categories of new sources and air pollutants subject to the provisions of this section.

(4) The provisions of this section shall apply to any new source owned or operated by the United States.

• • • •

(e) Prohibited acts.

After the effective date of standards of performance promulgated under this section, it shall be unlawful for any owner or operator of any new source to operate such source in violation of any standard of performance applicable to such source. (July 14, 1955, ch. 360, title I, § 111, as added Dec. 31, 1970, Pub. L. 91-604, § 4(a), 84 Stat. 1683.)

* * * *

§ 1857h-5. Administrative proceedings and judicial review.

(b)(1) A petition for review of action of the Administrator in promulgating any national primary or secondary ambient air quality standard, any emission standard under section 1857c-7 of this title, any standard of performance under section 1857c-6 of this title, any standard under

section 1857f-1 of this title (other than a standard required to be prescribed under section 1857f-1(b)(1) of this title), any determination under section 1857f-1(b)(5) of this title, any control or prohibition under section 1857f-6c of this title or any standard under section 1857f-9 of this title may be filed only in the United States Court of Appeals for the District of Columbia. A petition for review of the Administrator's action in approving or promulgating any implementation plan under section 1857c-5 of this title or section 1857c-6(d) of this title, may be filed only in the United States Court of Appeals for the appropriate circuit. Any such petition shall be filed within 30 days from the date of such promulgation or approval, or after such date if such petition is based solely on grounds arising after such 30th day.

EXCERPTS FROM THE NATIONAL ENVIRONMENTAL POLICY ACT, 42 U.S.C. § 4321

§ 4332. Cooperation of agencies; reports; availability of information; recommendations; international and national coordination of efforts

The Congress authorizes and directs that, to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this chapter, and (2) all agencies of the Federal Government shall—

(A) utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment;

(B) identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by subchapter II of this chapter, which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations;

(C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on—

(i) the environmental impact of the proposed action,

(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,

(iii) alternatives to the proposed action,

(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and

(v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Pub.L. 91–190, Title I, § 101, Jan. 1, 1970, 83 Stat. 852.